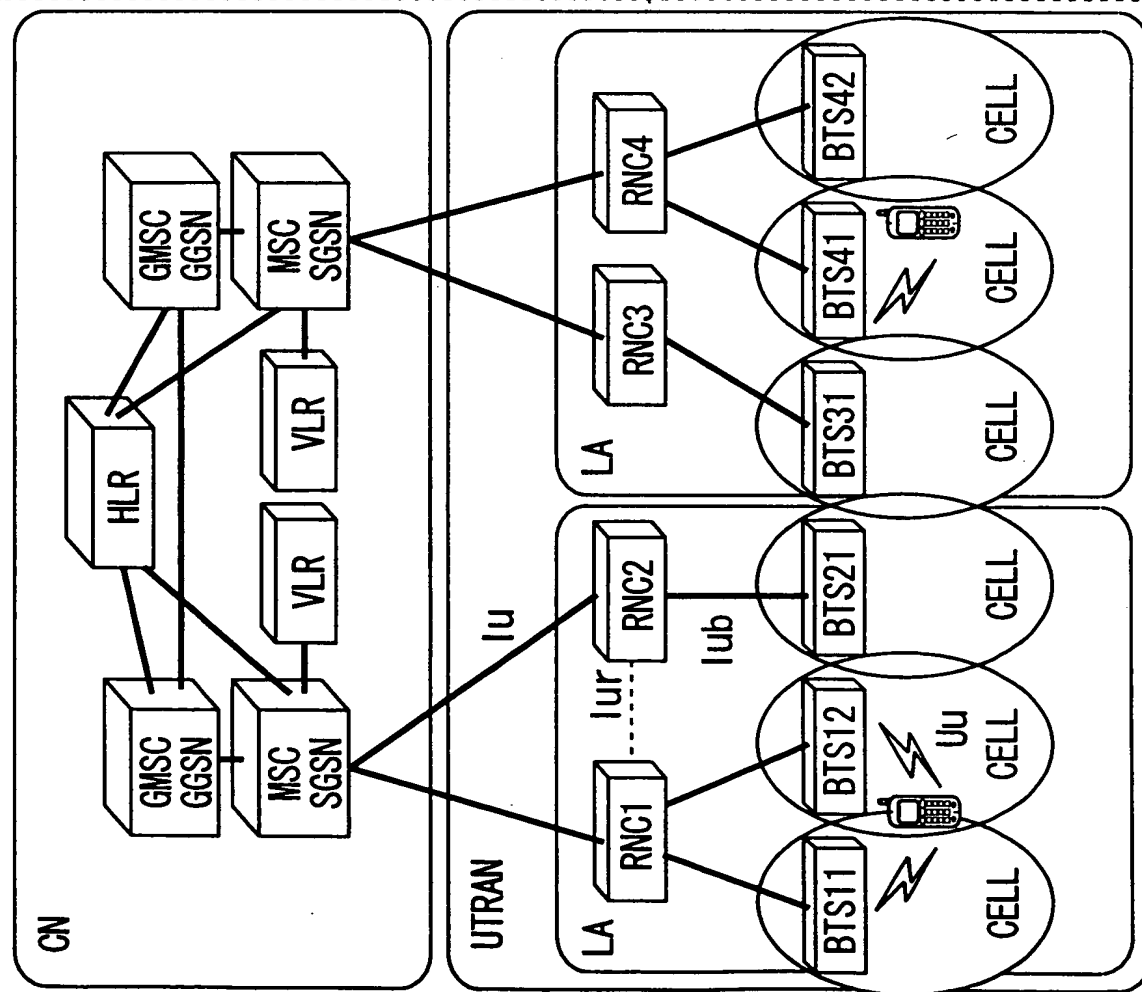


FIG. 1



CN: CORE NETWORK HAVING FUNCTION OF PERFORMING SWITCHING PROCESSING
 UTRAN: SUBSCRIBER ACCESS NETWORK CONTAINING WIRELESS PORTION
 LA: LOCATION MANAGEMENT UNIT AT THE TIME WHEN TERMINAL DOES NOT PERFORM COMMUNICATION (CALLED "RA" IN THE CASE OF PACKET COMMUNICATION)
 CELL: WIRELESS SERVICE AREA FORMED BY EACH BTS, CELL BECOMES LOCATION MANAGEMENT UNIT AT THE TIME WHEN TERMINAL PERFORMS COMMUNICATION
 GMSC/MS: SWITCHING APPARATUS FOR LINE CALL
 GGSN/SGSN: SWITCHING APPARATUS FOR PACKET CALL
 HLR: LOCATION MANAGEMENT REGISTER
 VLR: VISITOR LOCATION MANAGEMENT REGISTER
 RNCn: RAN (RADIO ACCESS NETWORK) CONTROL APPARATUS
 BTSn: WIRELESS BASE STATION
 Iu: INTERFACE BETWEEN CN AND RAN
 Iur: INTERFACE BETWEEN RNCs
 Iub: INTERFACE BETWEEN RNC AND BTS
 Uu: INTERFACE BETWEEN BTS AND TERMINAL

FIG. 2

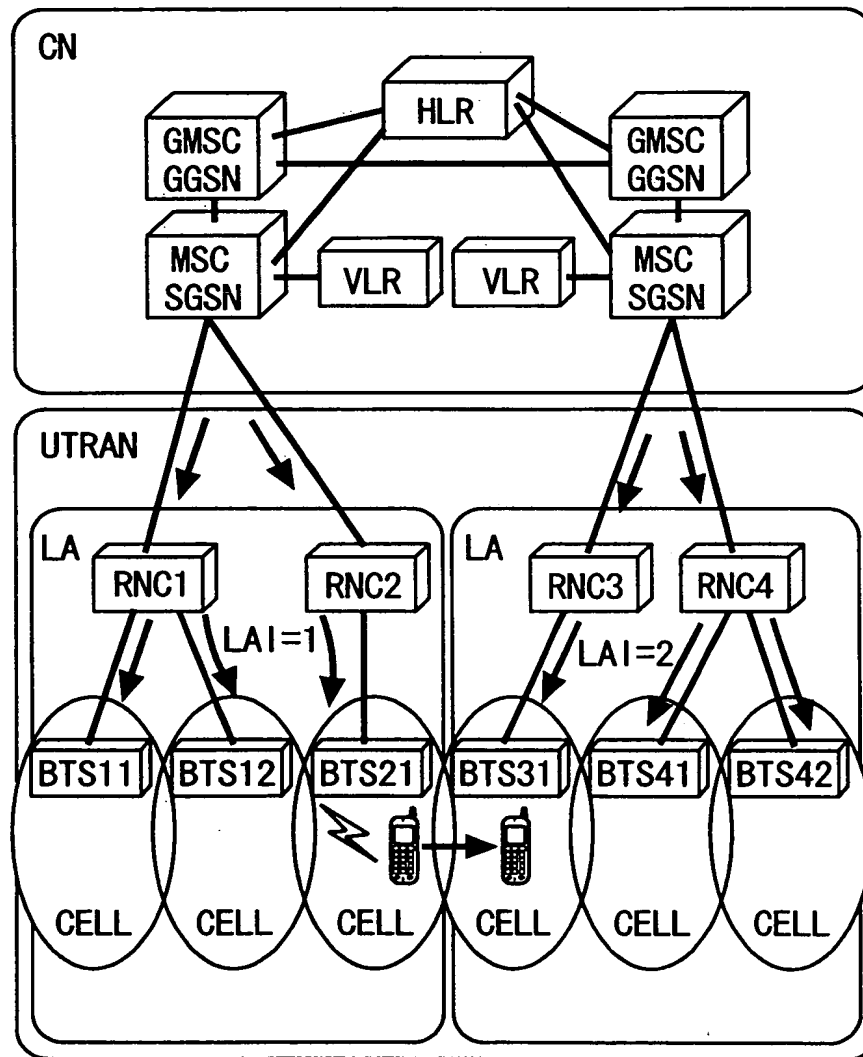


FIG. 3

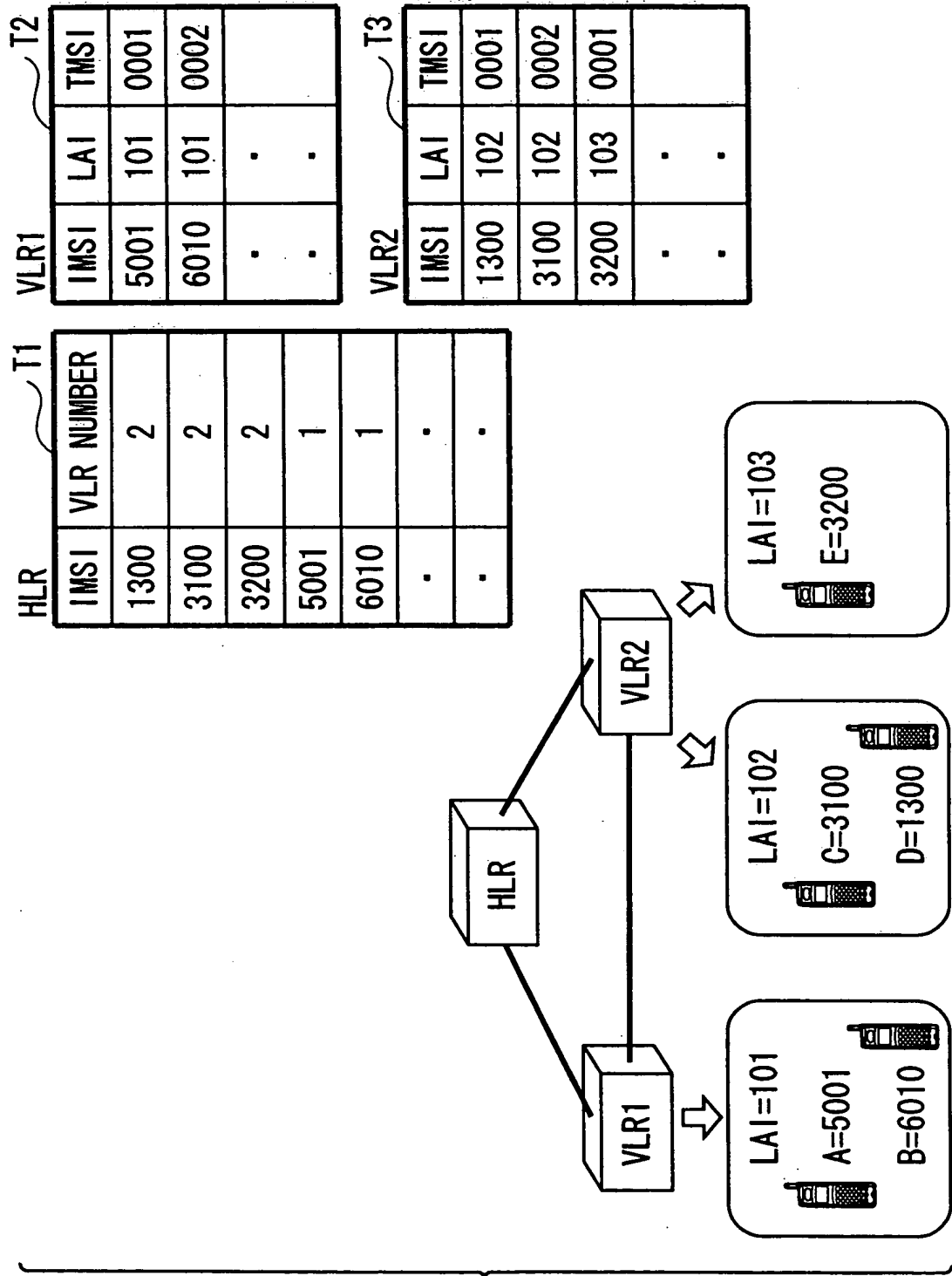


FIG. 4

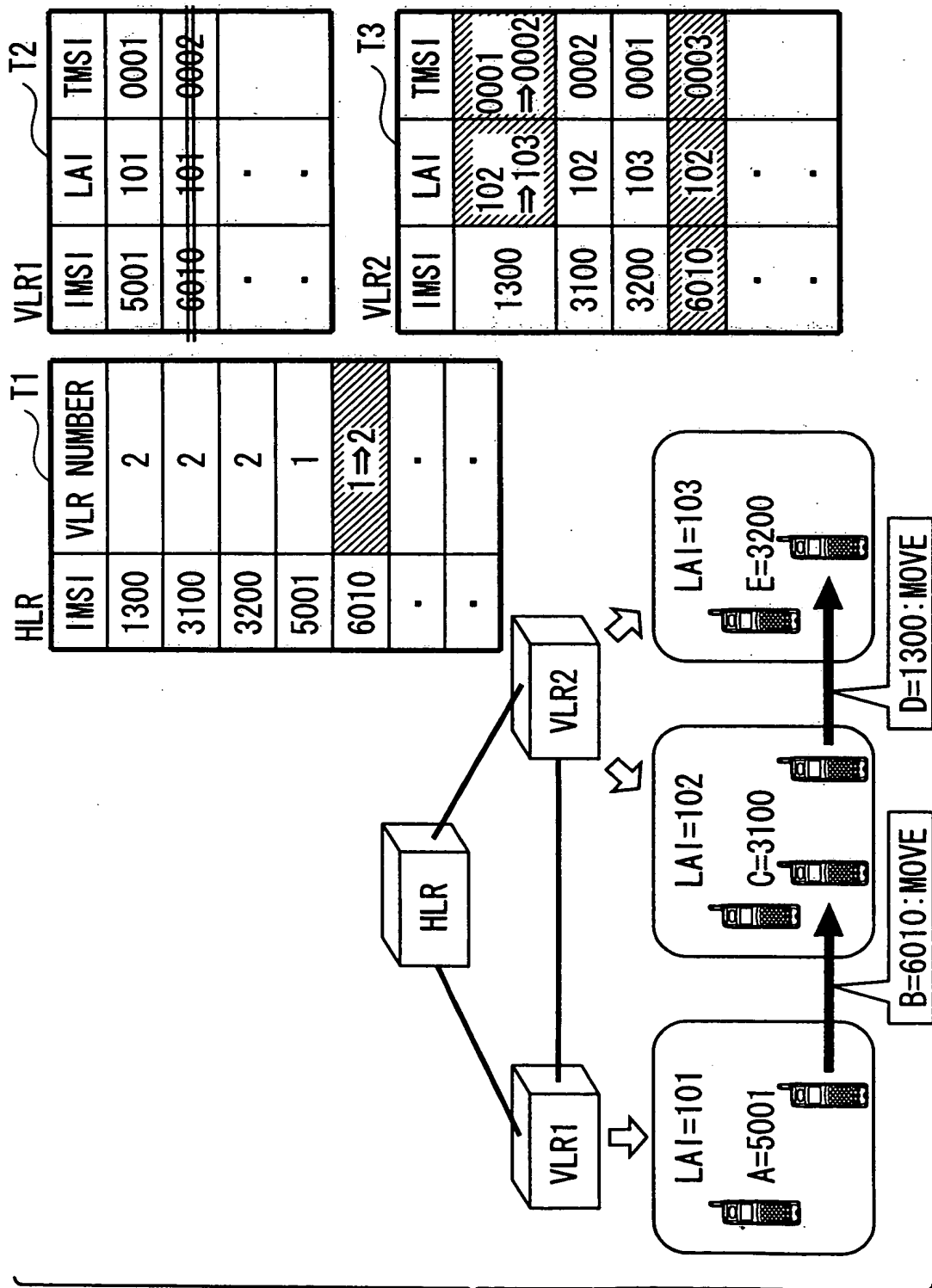


FIG. 5

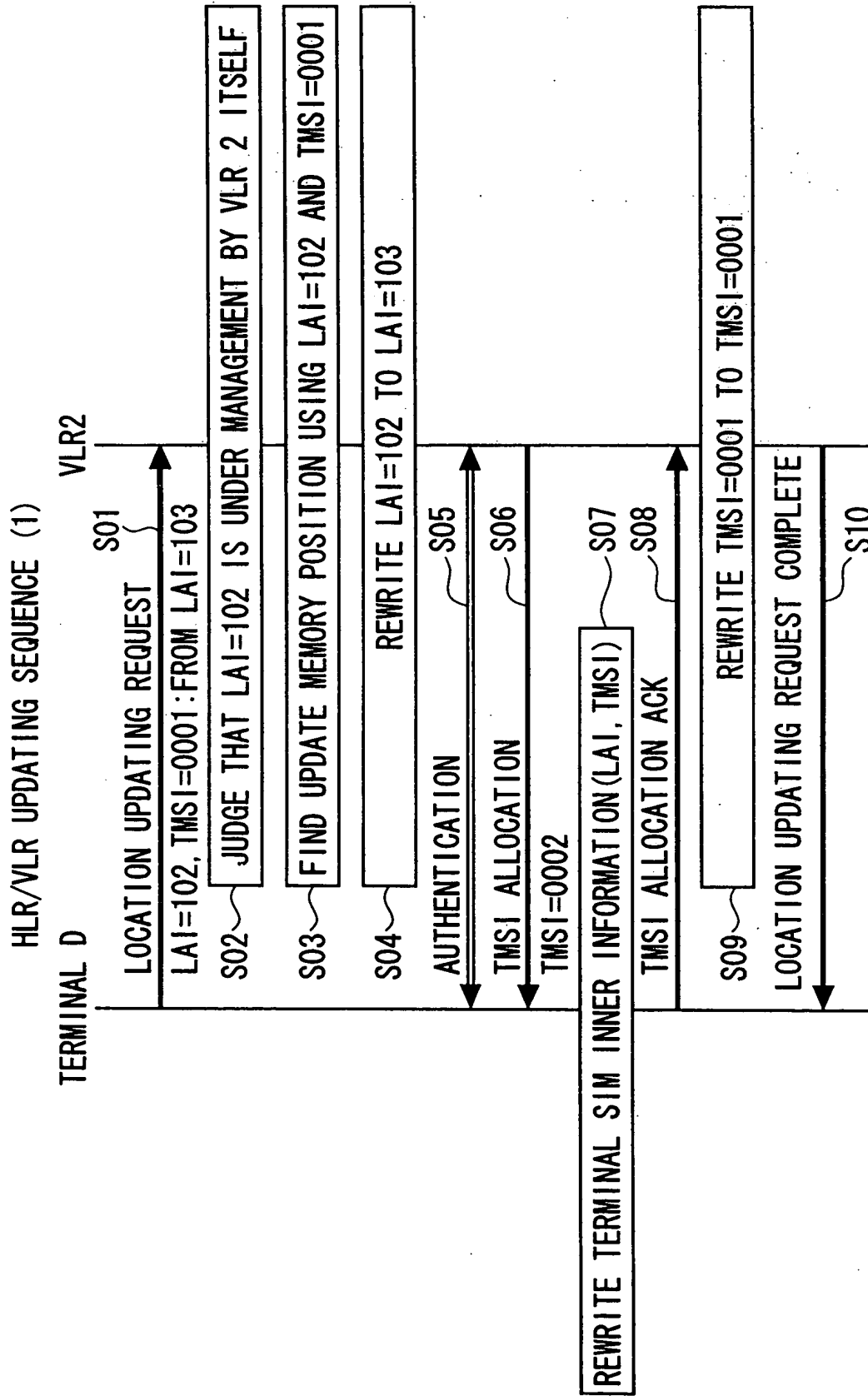


FIG. 6

HLR/VLR UPDATING SEQUENCE (2)

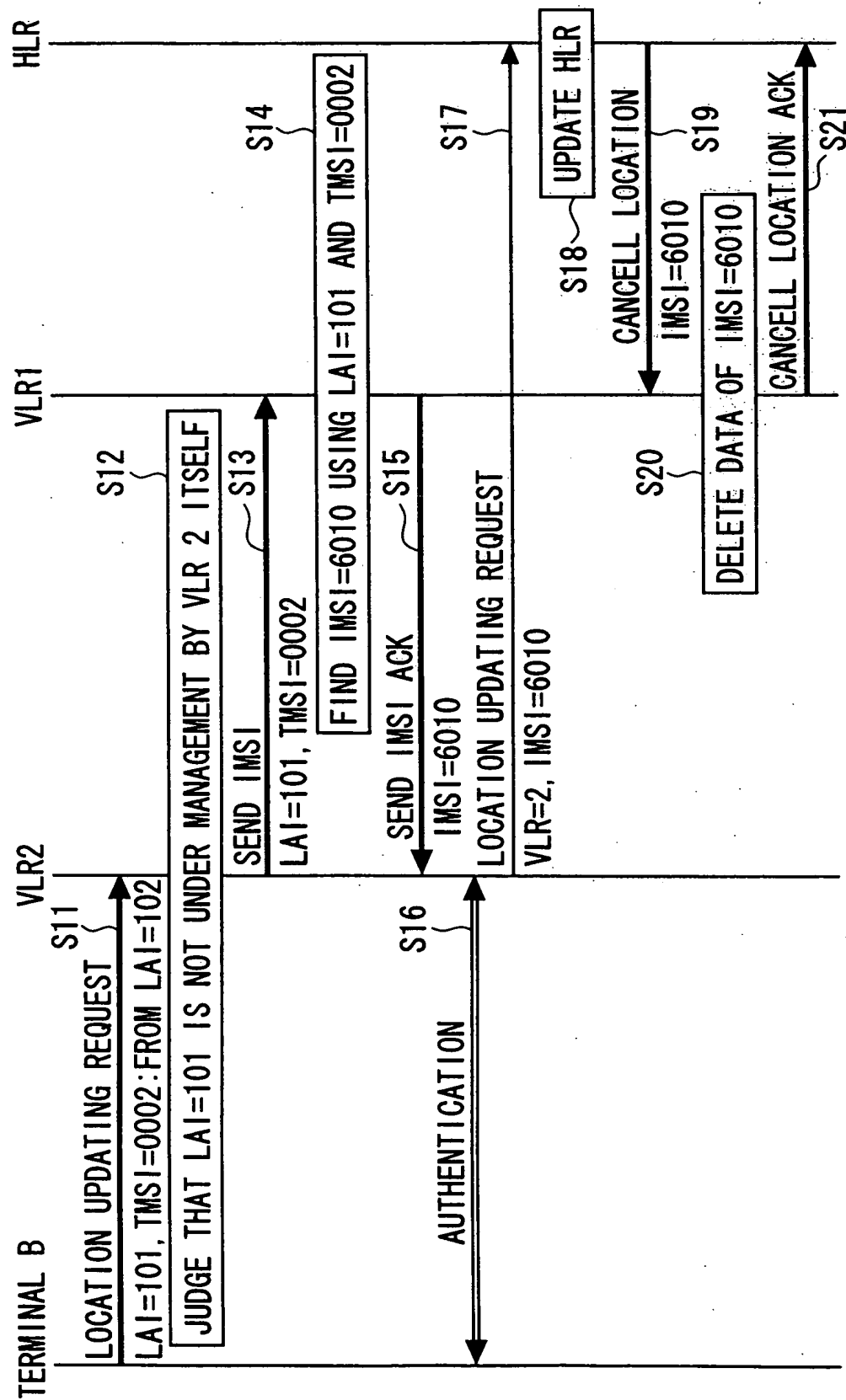


FIG. 7

HLR/VLR UPDATING SEQUENCE (2)

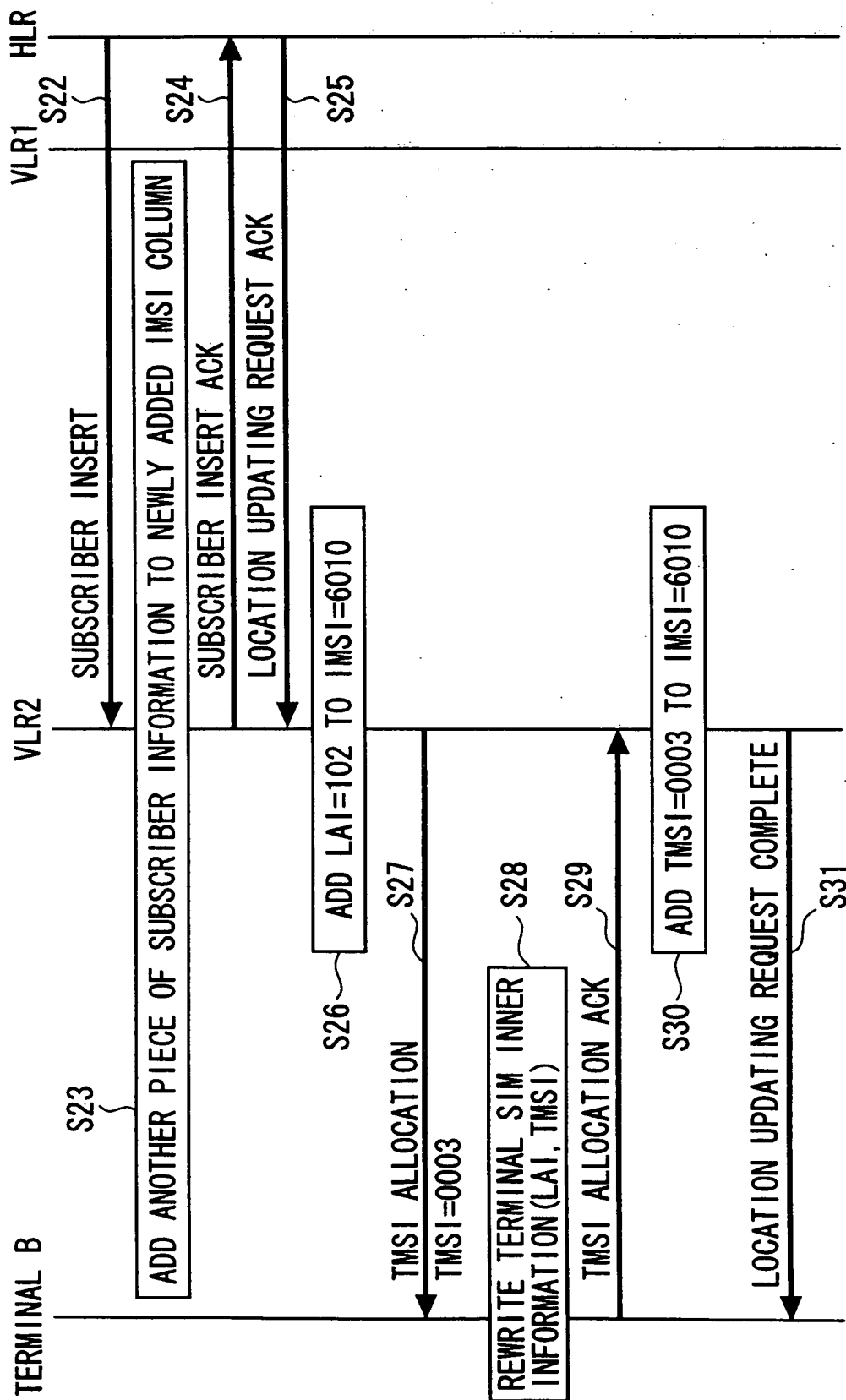


FIG. 8

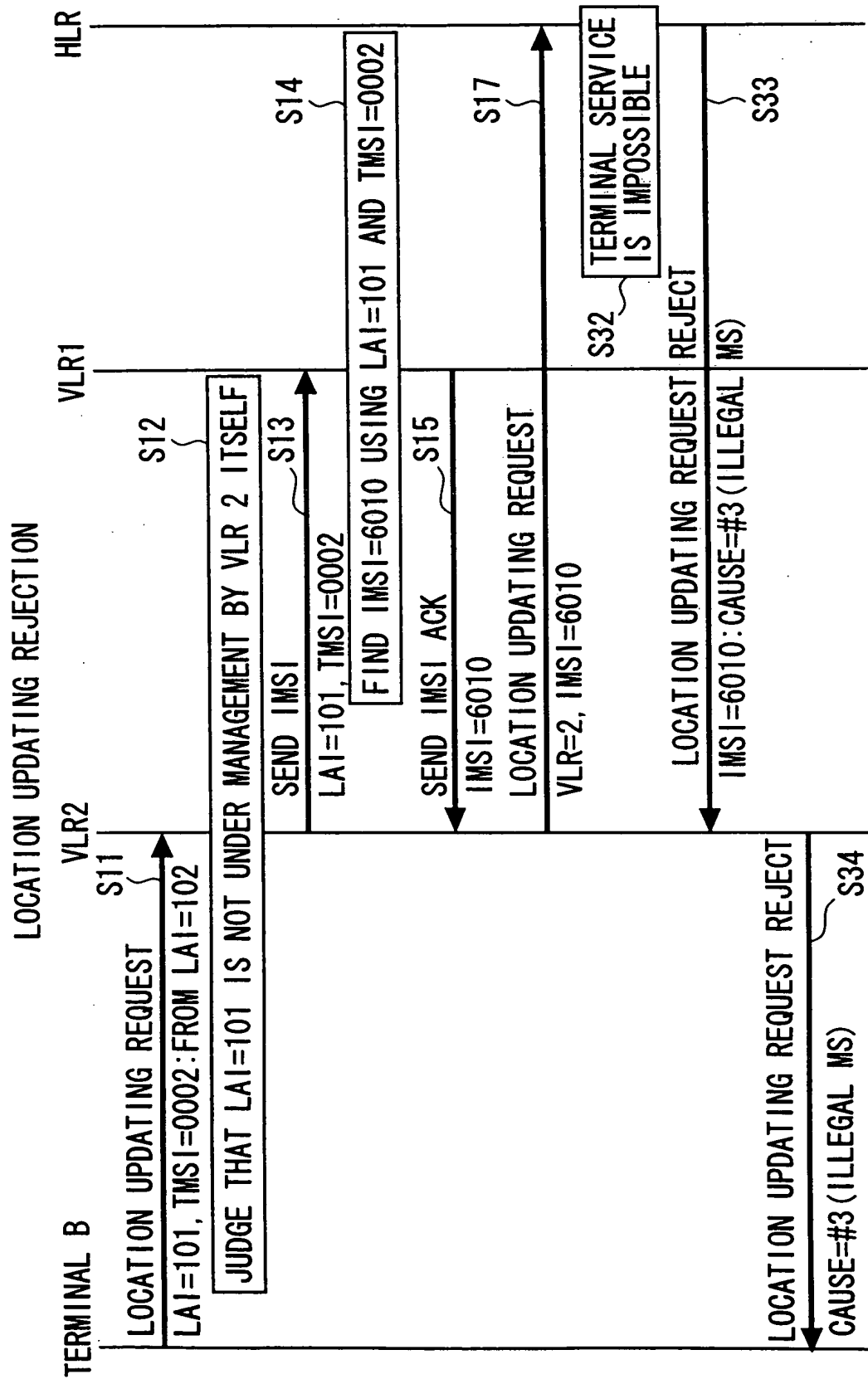


FIG. 9

TERMINAL STATE TRANSITION

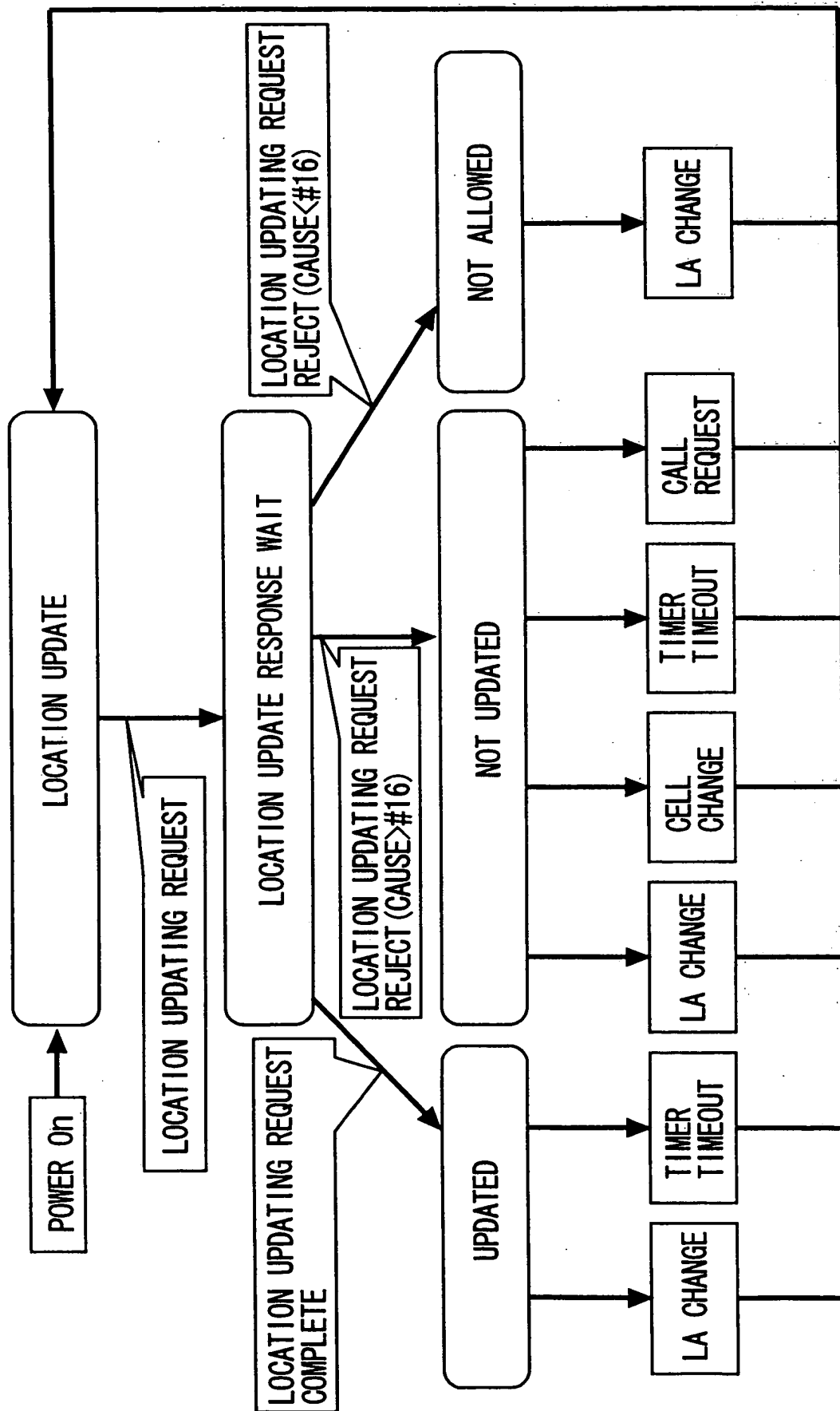


FIG. 10

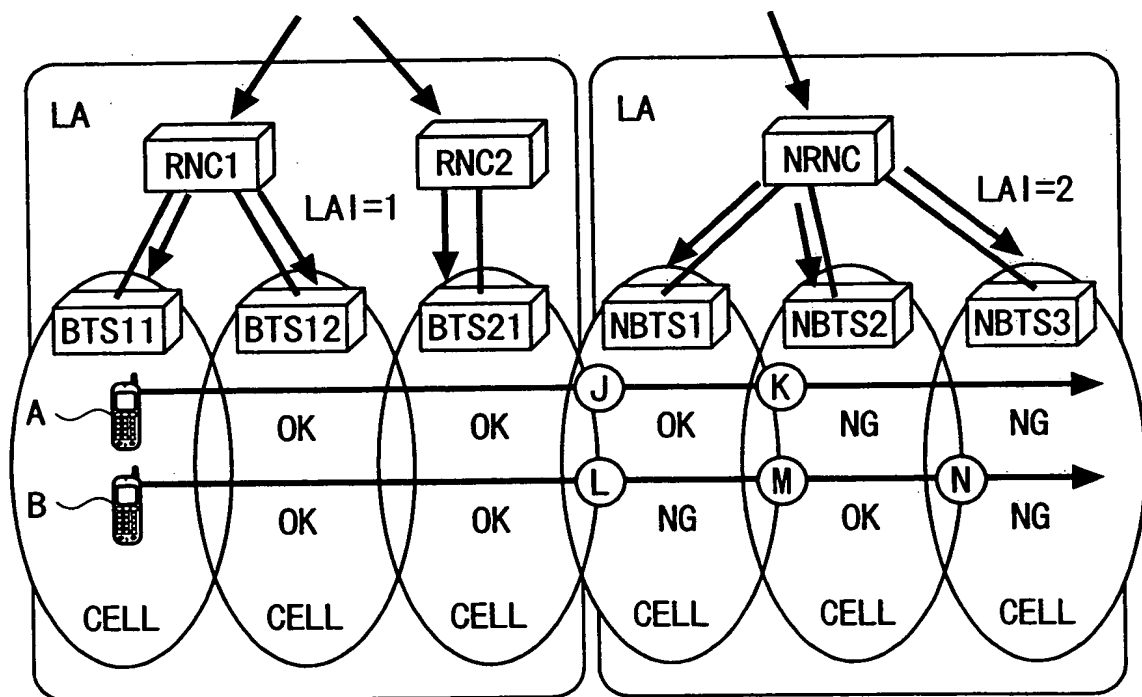


FIG. 11A

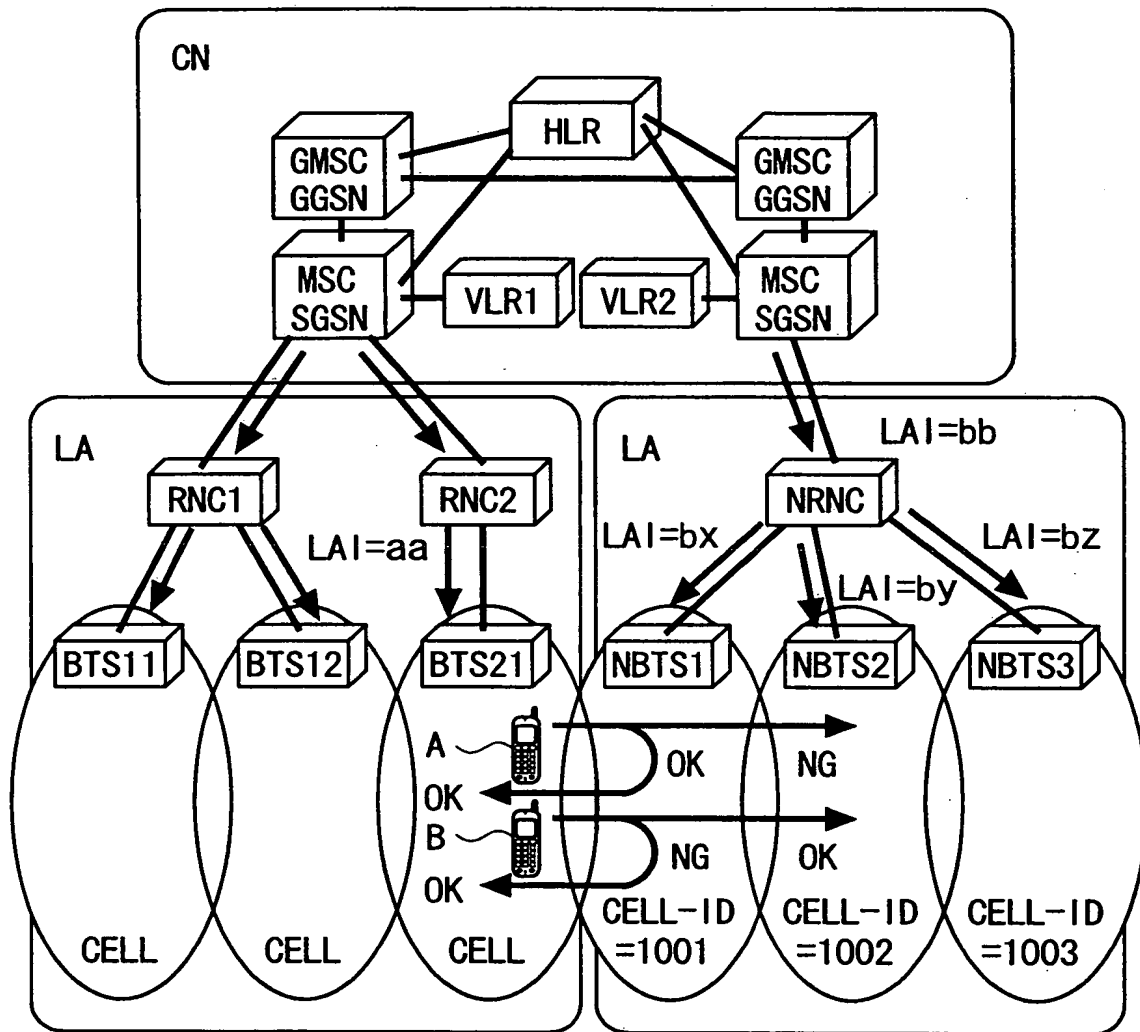


FIG. 11B

UPPER LAI No	BTS	LOWER LAI No
bb	NBTS1	bx
	NBTS2	by
	NBTS3	bz

FIG. 12

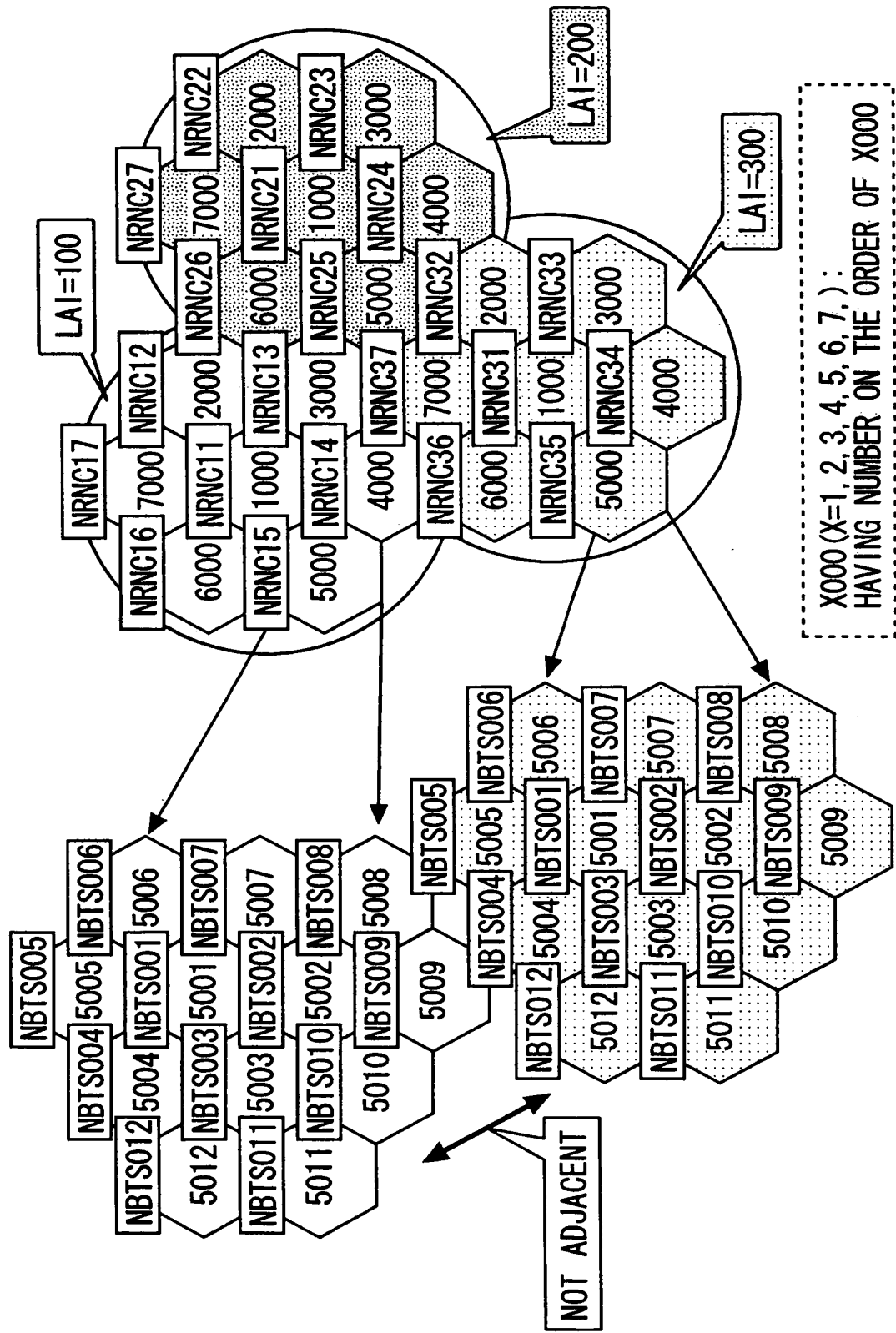


FIG. 13A

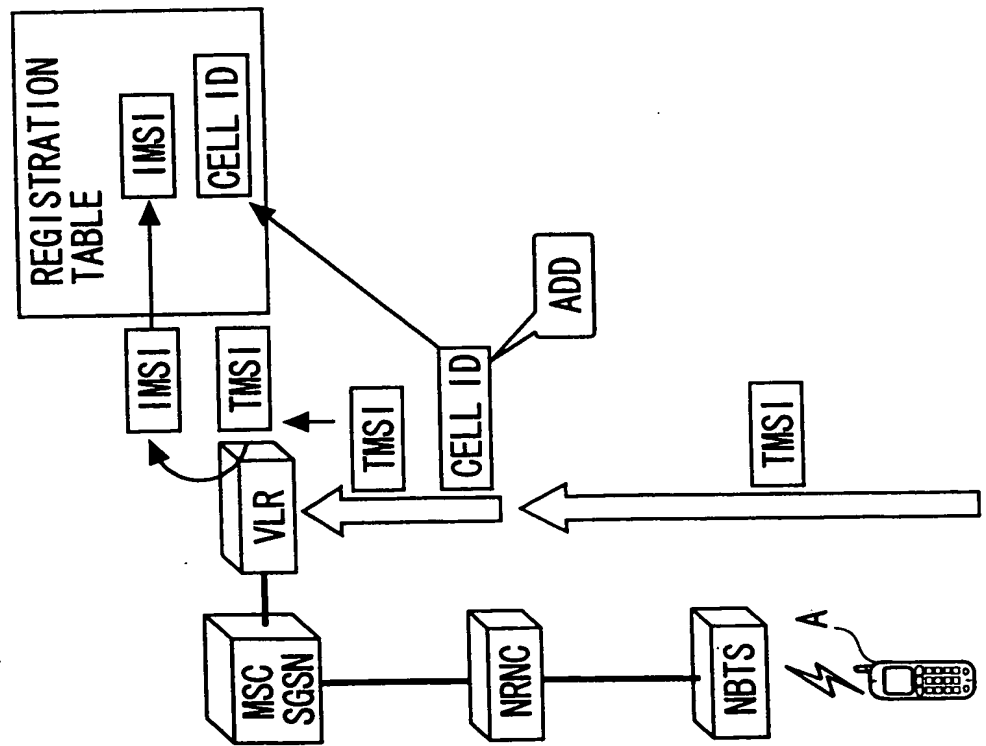


FIG. 13B

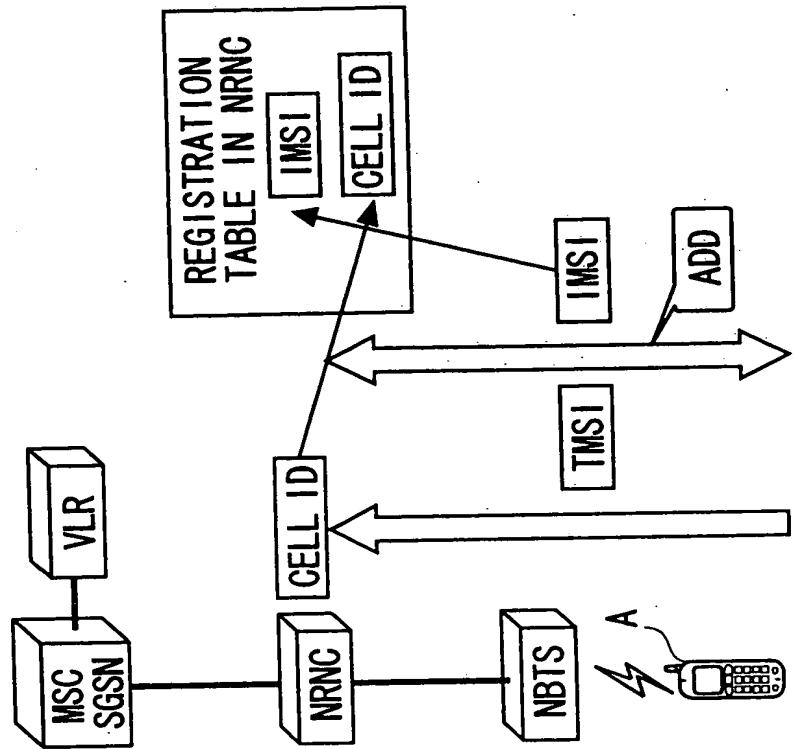


FIG. 14A

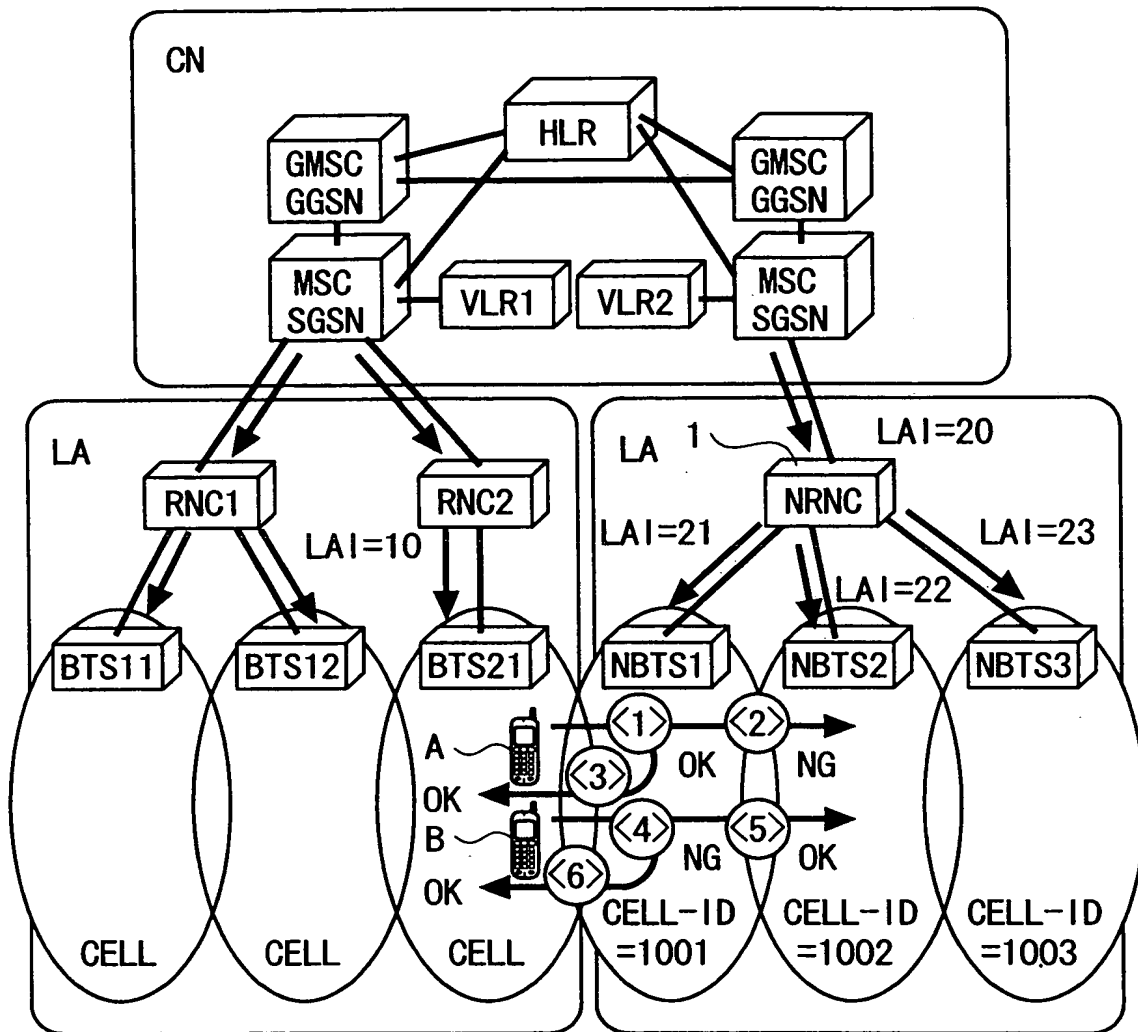


FIG. 14B

UPPER LAI No	BTS	LOWER LAI No
20	NBTS1	21
	NBTS2	22
	NBTS3	23

FIG. 15A

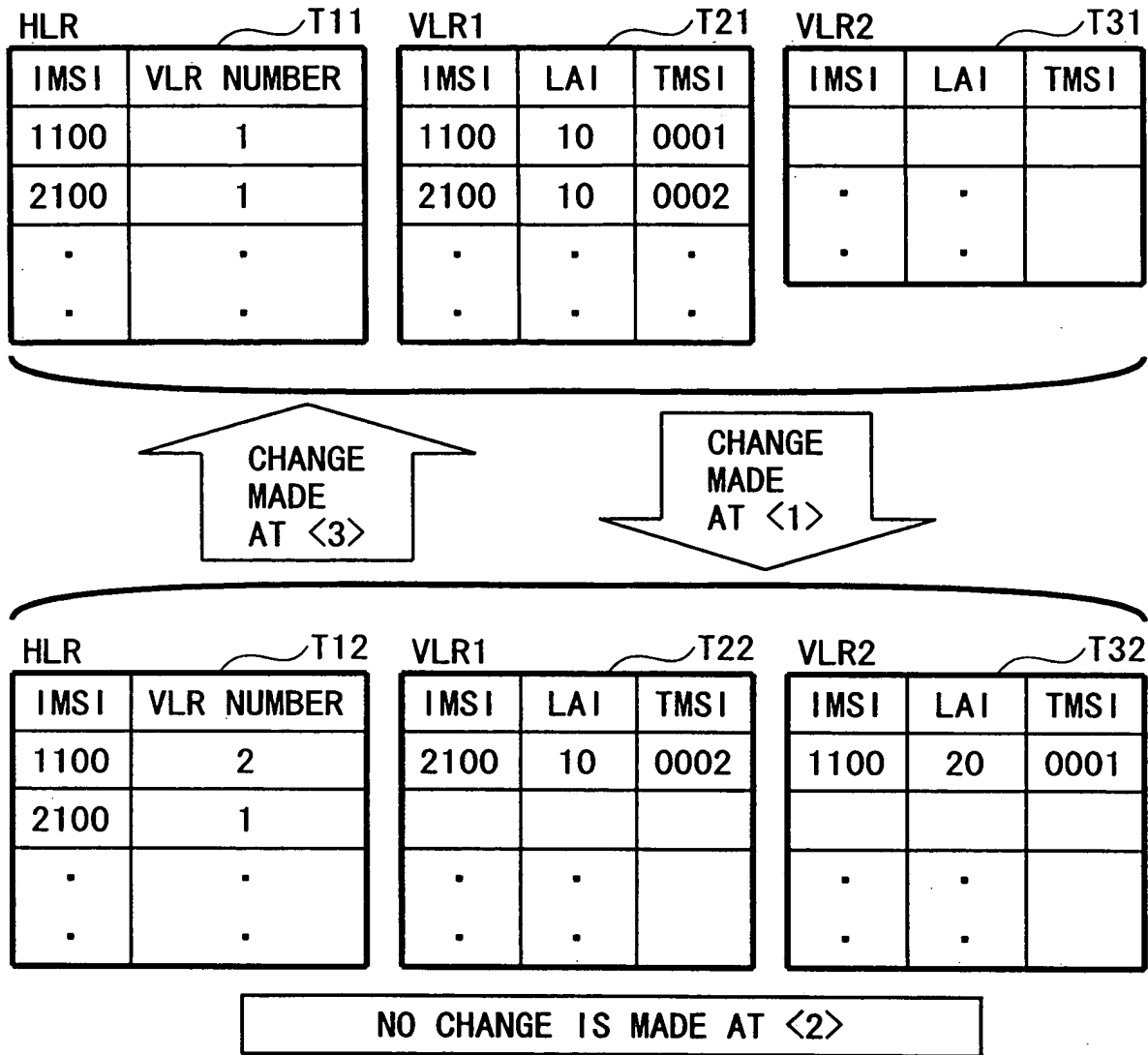


FIG. 15B

TERMINAL REGISTRATION TABLE

BTS	CELL-ID	IMSI	3 MULTIPLE IS POSSIBLE
NBTS1	1001	1100	
NBTS2	1002	2100	
NBTS3	1003		

FIG. 16A

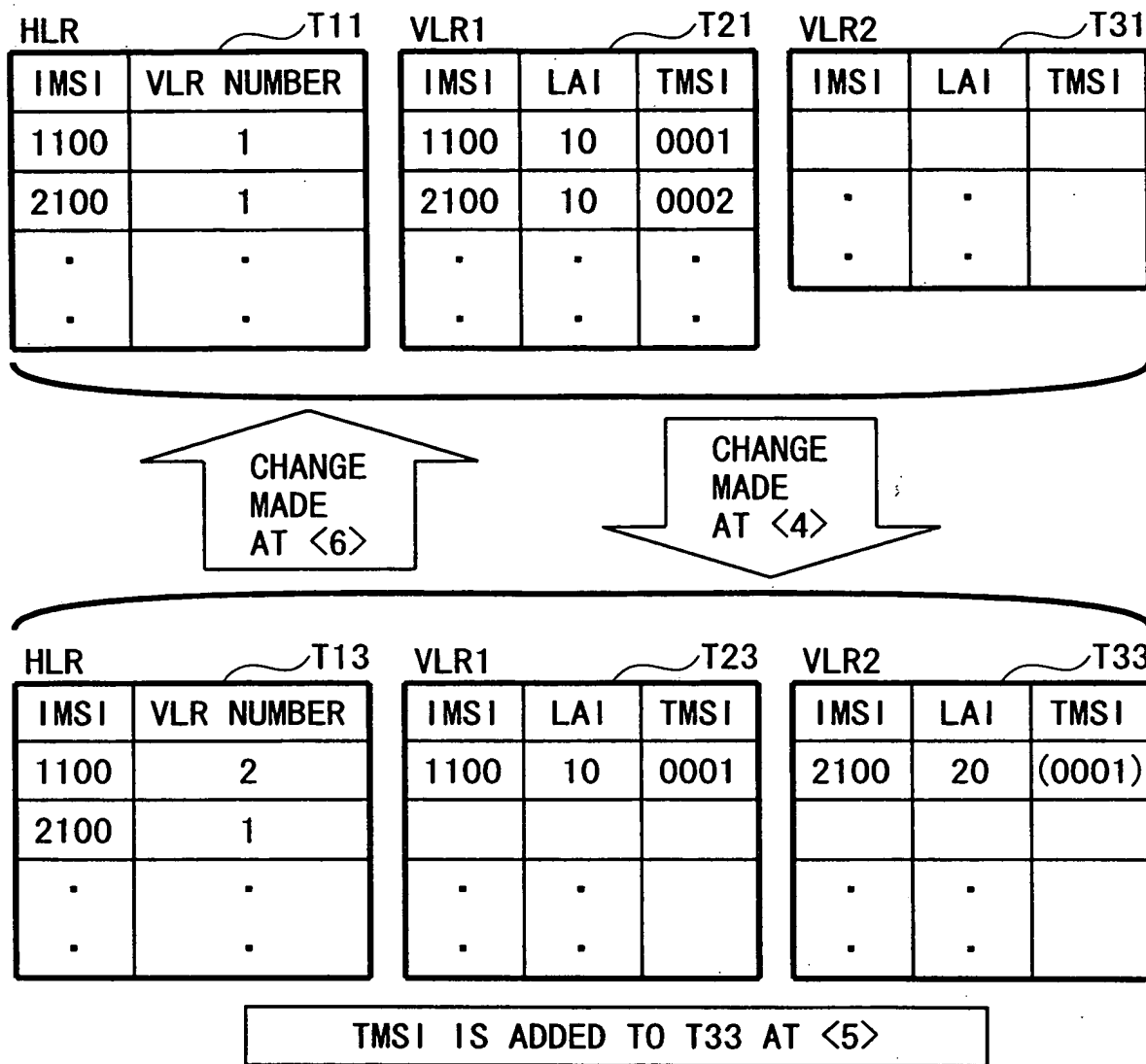
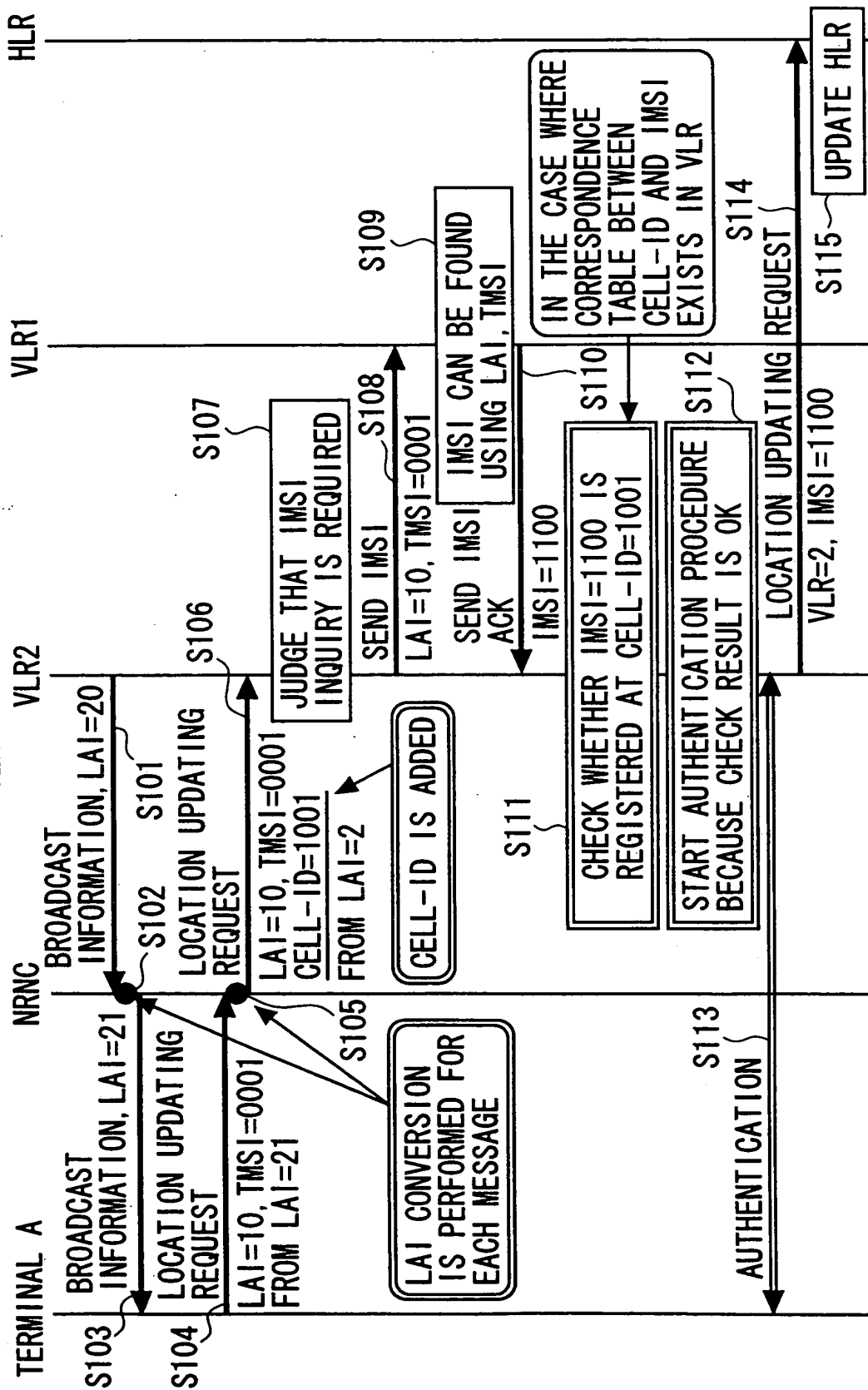


FIG. 16B

TERMINAL REGISTRATION TABLE

BTS	CELL-ID	IMSI	
NBTS1	1001	1100	MULTIPLE IS POSSIBLE
NBTS2	1002	2100	
NBTS3	1003		

[illegible]

```

sequenceDiagram
    participant TA as TERMINAL A
    participant NRNC as NRNC
    participant VLR2 as VLR2
    participant VLR1 as VLR1
    participant HLR as HLR

    VLR1->>HLR: CANCELLED LOCATION REQUEST (S116)
    HLR->>VLR1: CANCELLED LOCATION ACK (S117)
    VLR1->>VLR2: DELETE IMSI=1100 (S118)
    VLR2->>NRNC: SUBSCRIBER INSERT (S120)
    NRNC->>TA: TMSI ALLOCATION (S124)
    TA->>NRNC: TMSI ALLOCATION ACK (S127)
    NRNC->>VLR2: ADD SUBSCRIBER INFORMATION TO IMSI COLUMN (S123)
    VLR2->>VLR1: SUBSCRIBER INSERT ACK (S121)
    VLR1->>HLR: LOCATION UPDATING REQUEST ACK (S122)
    NRNC->>TA: REWRITE TERMINAL SIM INNER INFORMATION (LAI, TMSI) (S126)
    TA->>NRNC: LOCATION UPDATING REQUEST COMPLETE (LAI=21) (S131)
    NRNC->>VLR2: LOCATION UPDATING REQUEST COMPLETE (LAI=20) (S130)
    VLR2->>VLR1: ADD TMSI=0001 TO IMSI=1100 (S128)
    VLR1->>HLR: LOCATION UPDATING REQUEST COMPLETE (S129)
  
```

The diagram illustrates the process of deleting an IMSI column and adding a new one, involving the following steps:

- Initial State:** The system is in a state where the IMSI column is being deleted.
- Cancel Location Request:** VLR1 sends a CANCELLED LOCATION REQUEST (S116) to HLR.
- Cancel Location Ack:** HLR sends a CANCELLED LOCATION ACK (S117) to VLR1.
- Delete IMSI:** VLR1 sends a DELETE IMSI=1100 (S118) message to VLR2.
- Subscriber Insert:** VLR2 sends a SUBSCRIBER INSERT (S120) message to NRNC.
- TMSI Allocation:** NRNC sends a TMSI ALLOCATION (S124) message to TERMINAL A.
- TMSI Allocation Ack:** TERMINAL A sends a TMSI ALLOCATION ACK (S127) message to NRNC.
- Add Subscriber Information:** NRNC sends an ADD SUBSCRIBER INFORMATION TO IMSI COLUMN (S123) message to VLR2.
- Subscriber Insert Ack:** VLR2 sends a SUBSCRIBER INSERT ACK (S121) message to VLR1.
- Location Updating Request Ack:** VLR1 sends a LOCATION UPDATING REQUEST ACK (S122) message to HLR.
- Rewrite Terminal SIM Inner Information:** NRNC sends a REWRITE TERMINAL SIM INNER INFORMATION (LAI, TMSI) (S126) message to TERMINAL A.
- Location Updating Request Complete:** TERMINAL A sends a LOCATION UPDATING REQUEST COMPLETE (LAI=21) (S131) message to NRNC.
- Location Updating Request Complete:** NRNC sends a LOCATION UPDATING REQUEST COMPLETE (LAI=20) (S130) message to VLR2.
- Add TMSI:** VLR2 sends an ADD TMSI=0001 TO IMSI=1100 (S128) message to VLR1.
- Location Updating Request Complete:** VLR1 sends a LOCATION UPDATING REQUEST COMPLETE (S129) message to HLR.

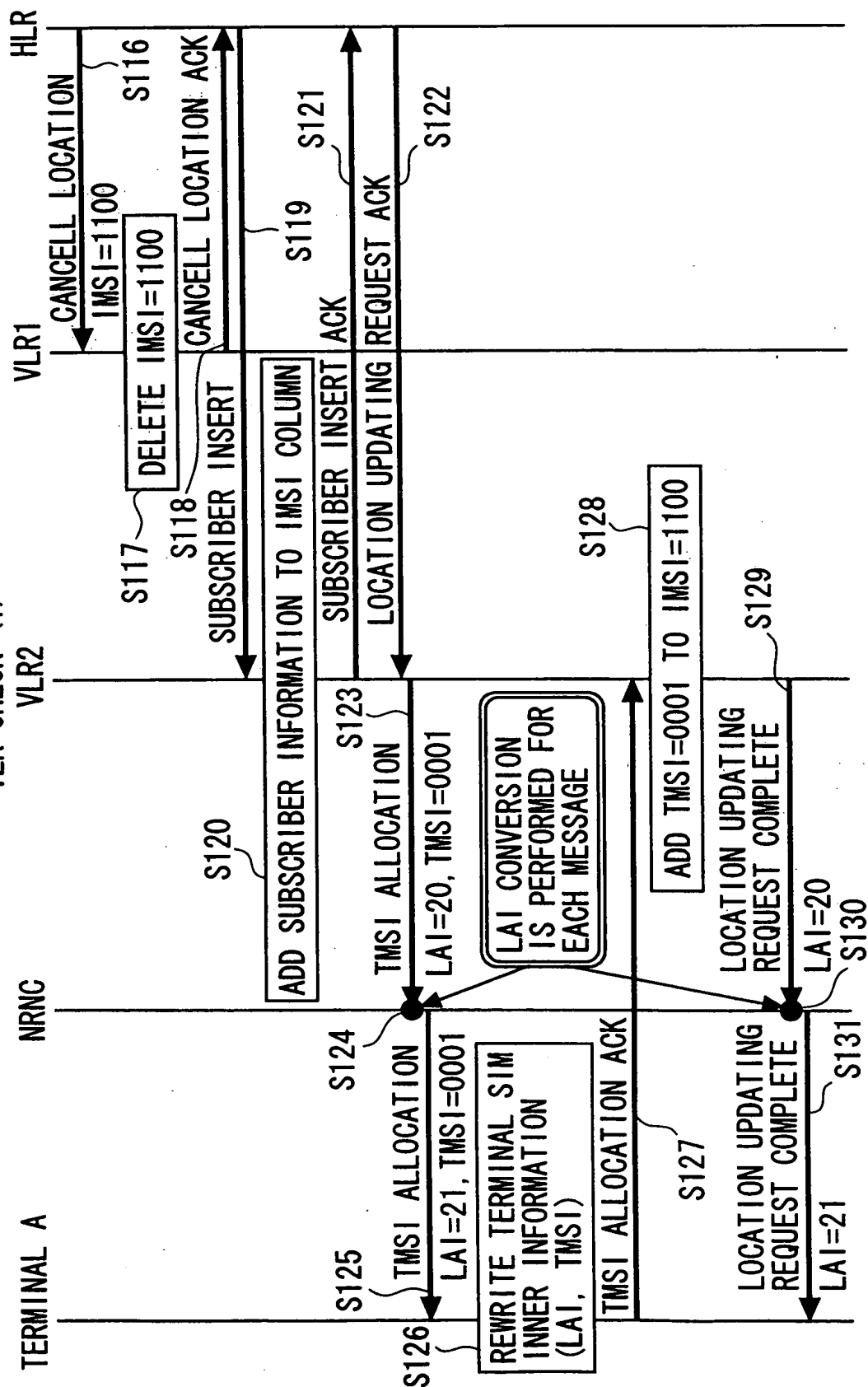


FIG. 19

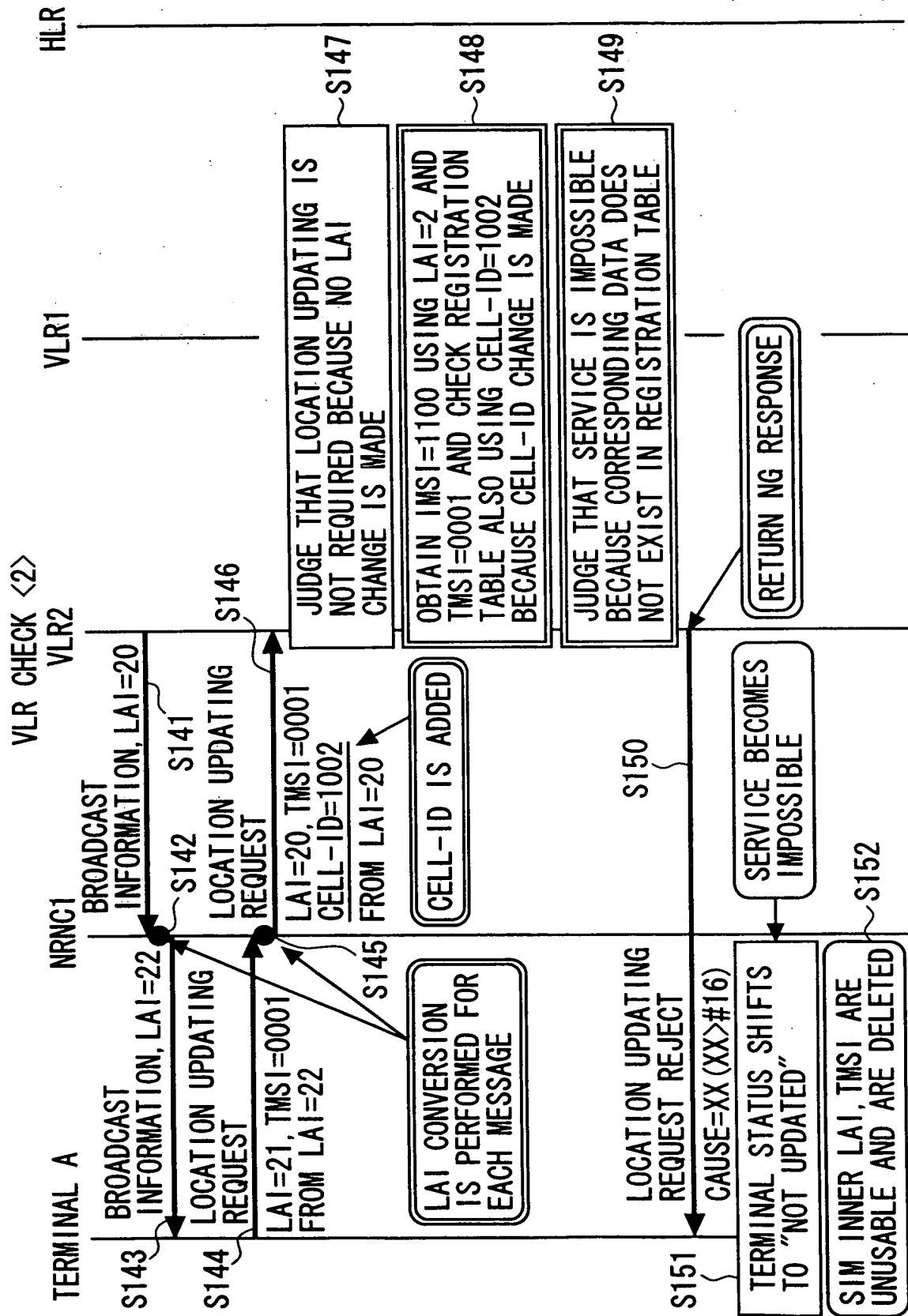


FIG. 20

VLR CHECK <3>

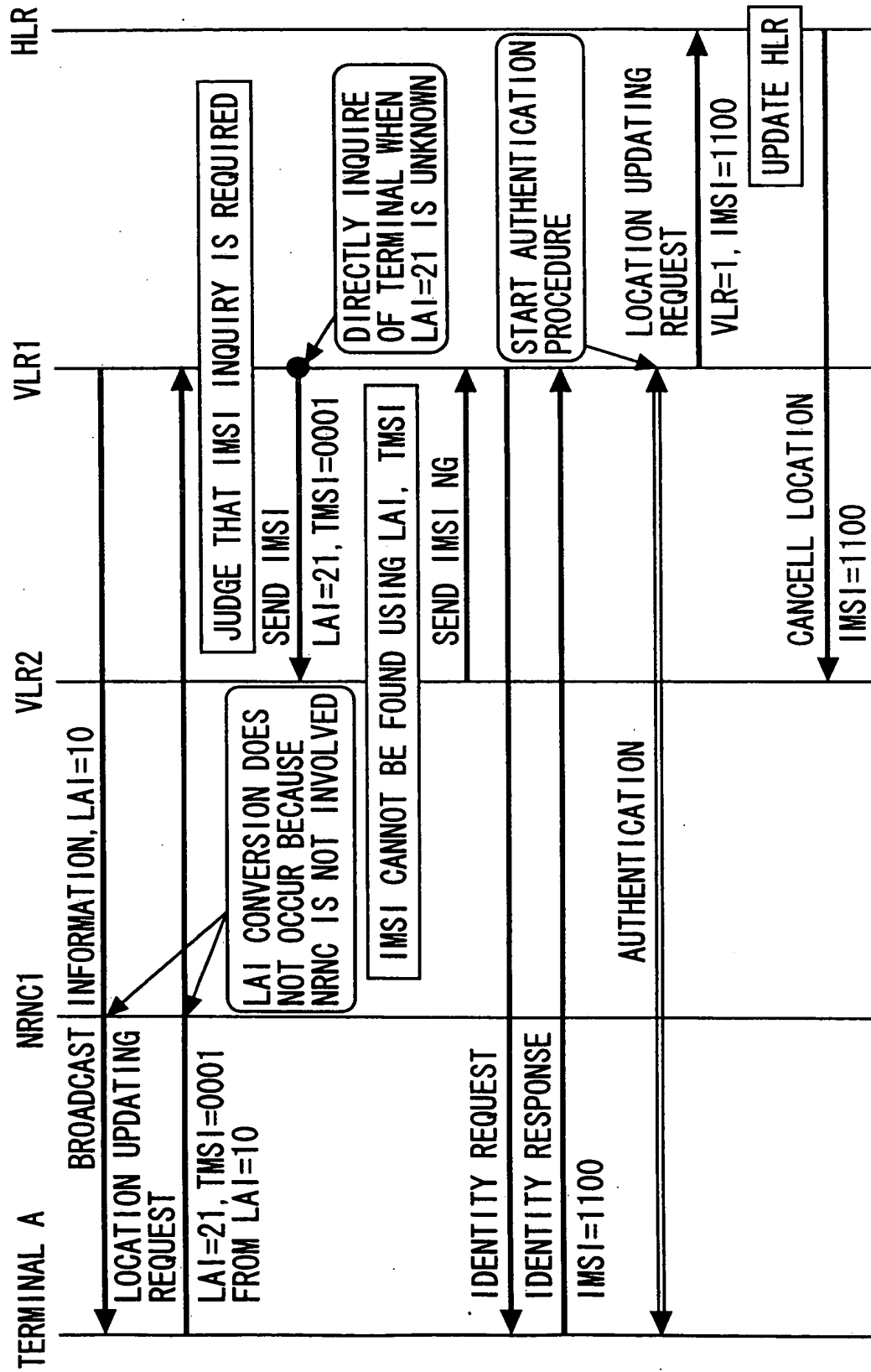


FIG. 21

VLR CHECK <3>

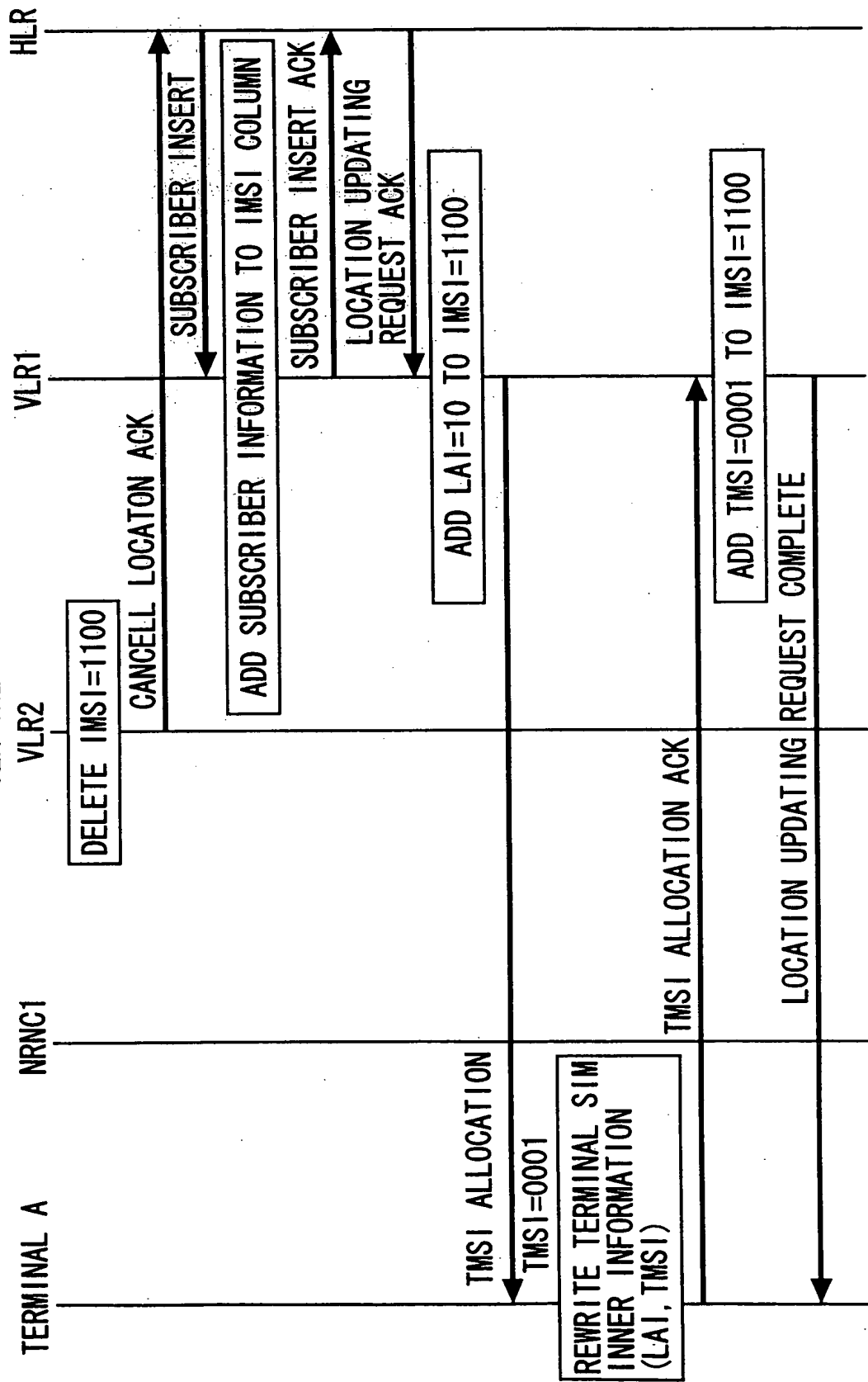


FIG. 22

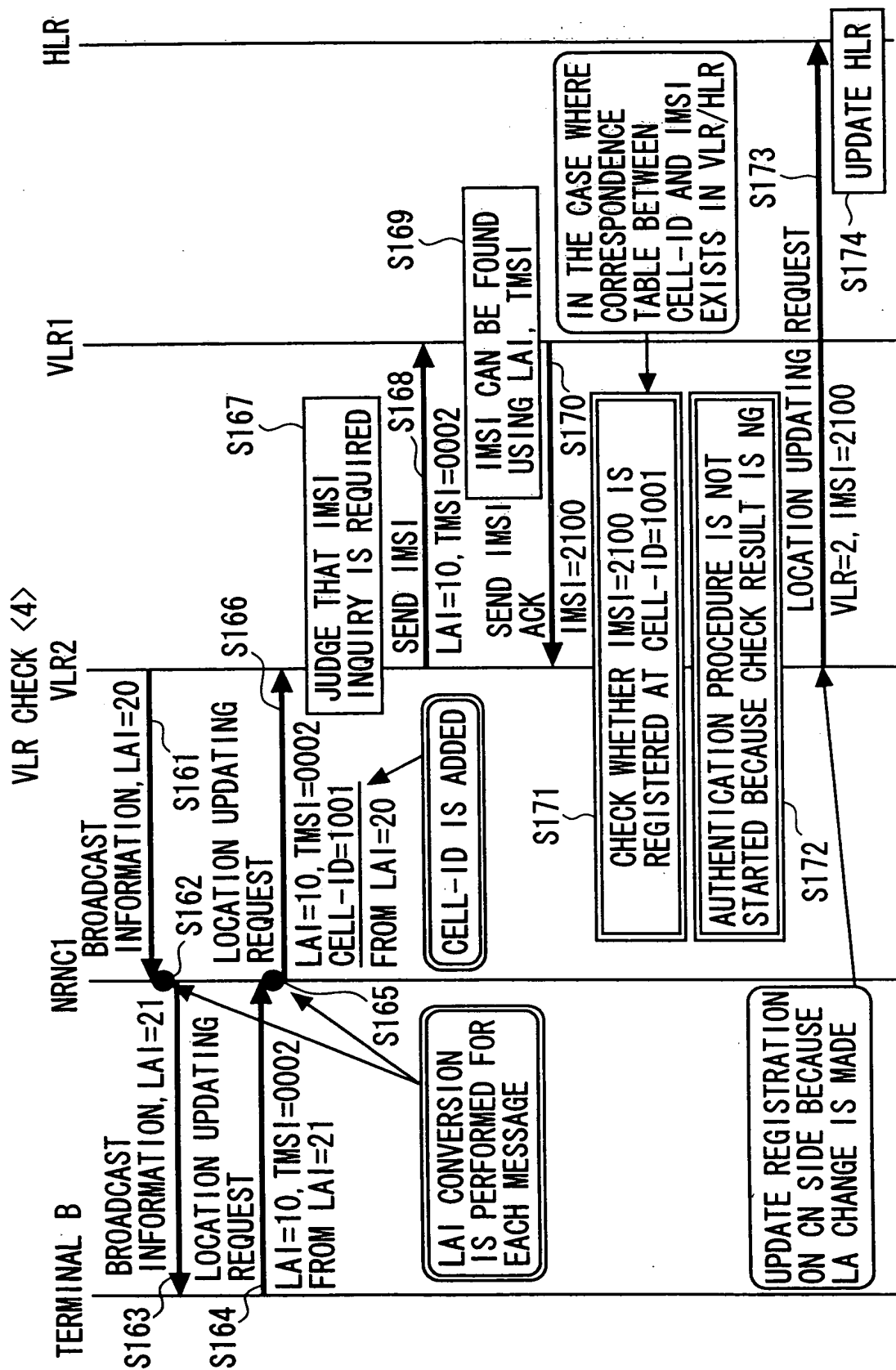


FIG. 24A

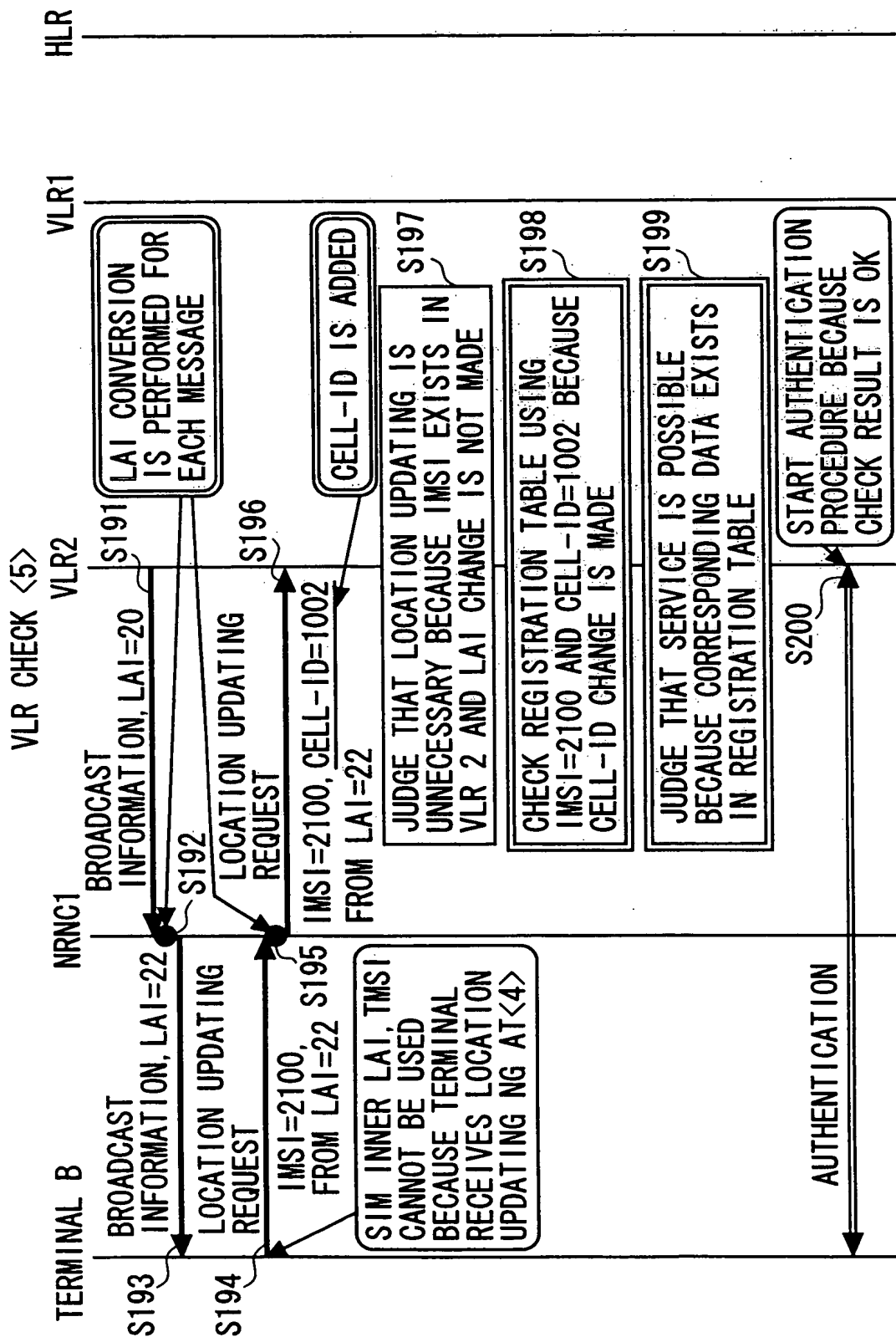


FIG. 25

VLR CHECK <6>

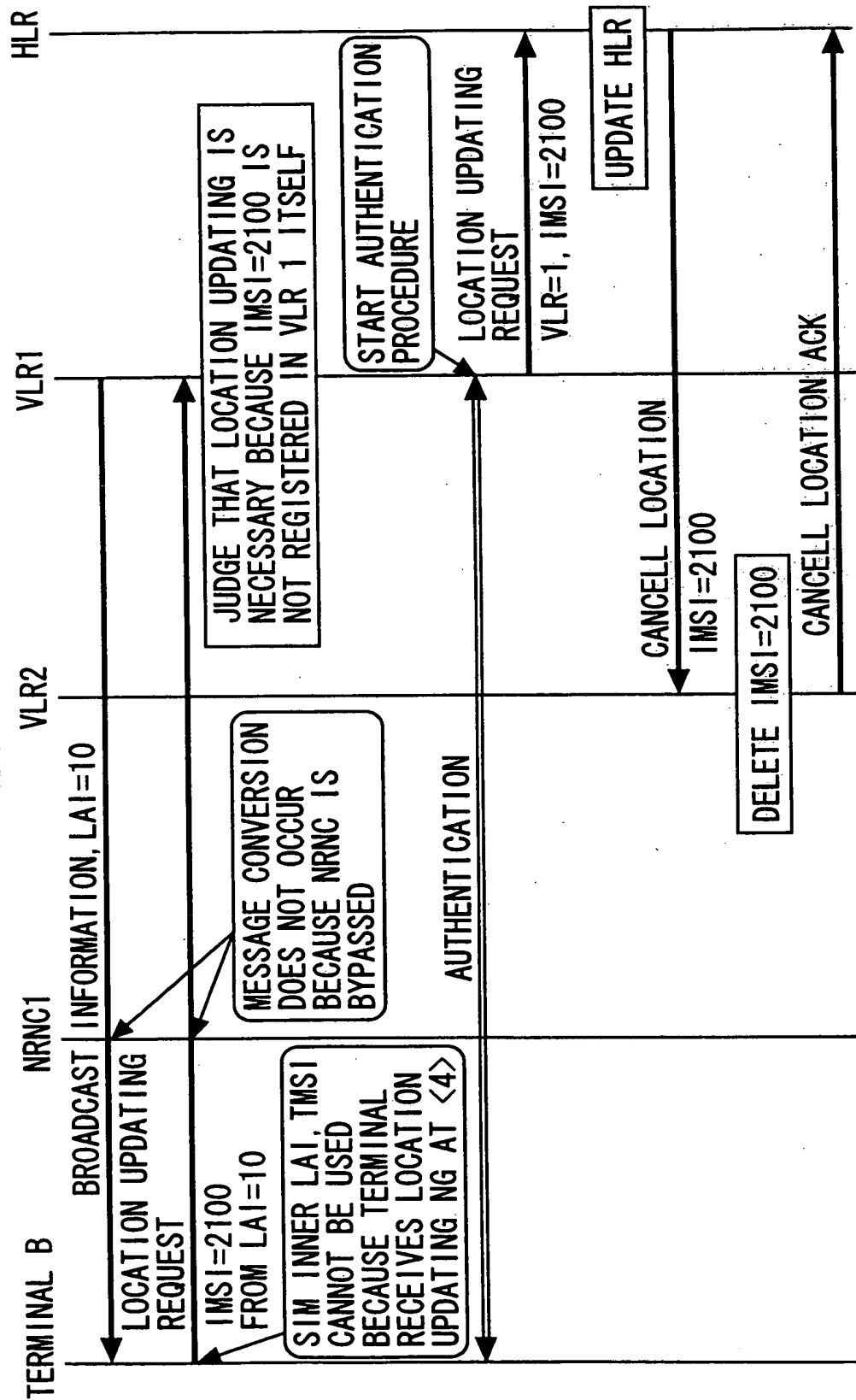


FIG. 26

VLR CHECK <6>

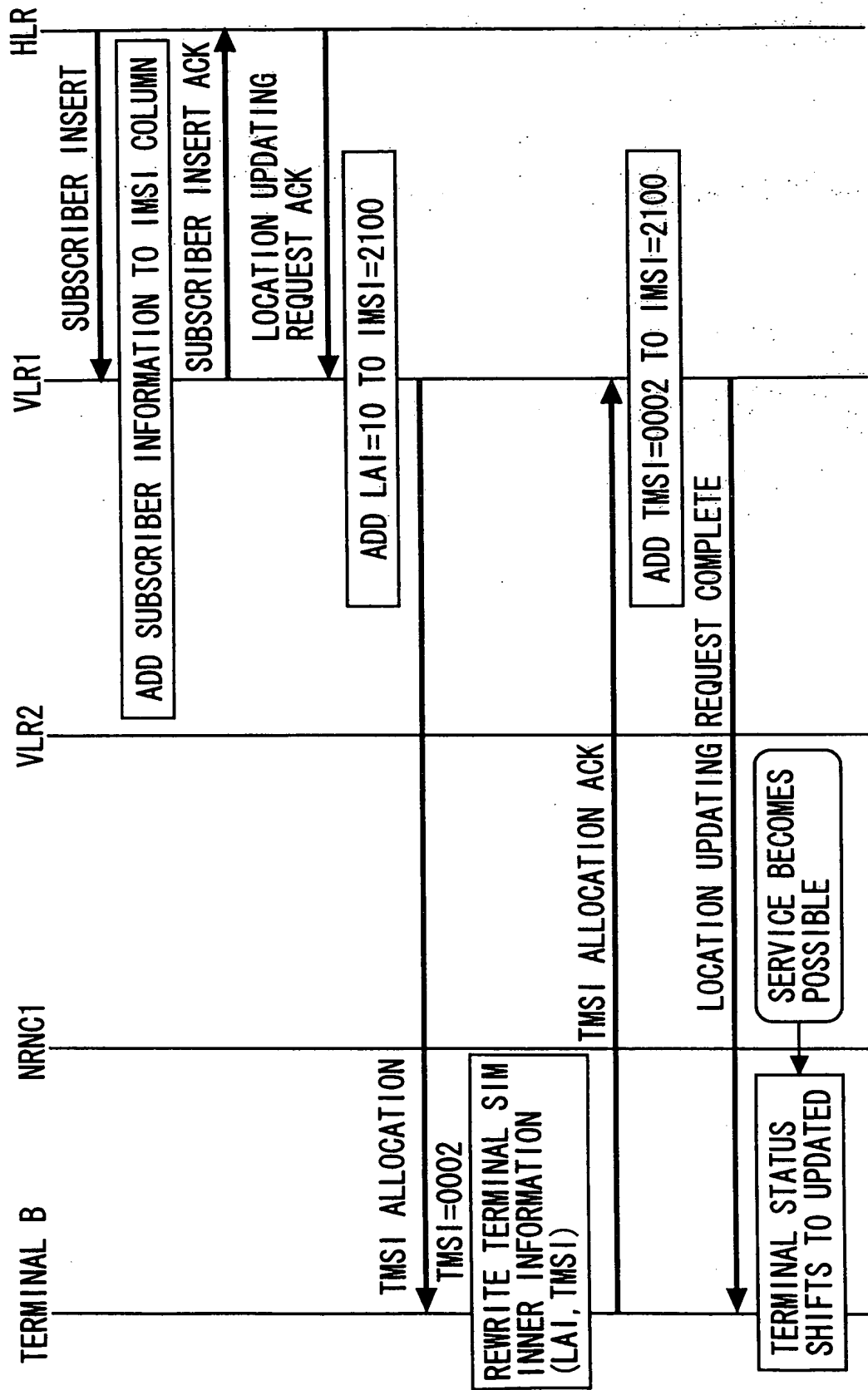


FIG. 27A

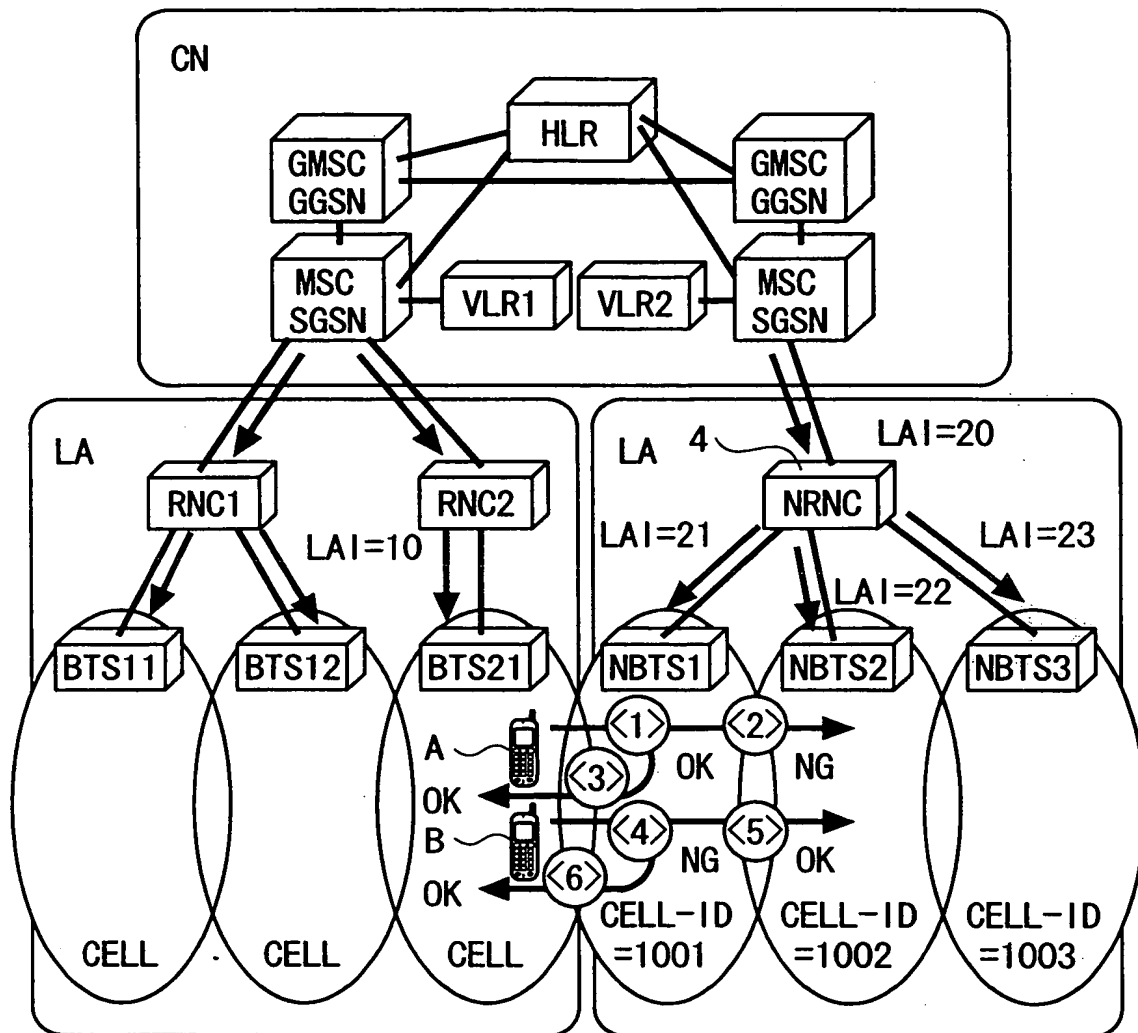


FIG. 27B

UPPER LAI No	BTS	LOWER LAI No
20	NBTS1	21
	NBTS2	22
	NBTS3	23

FIG. 28A

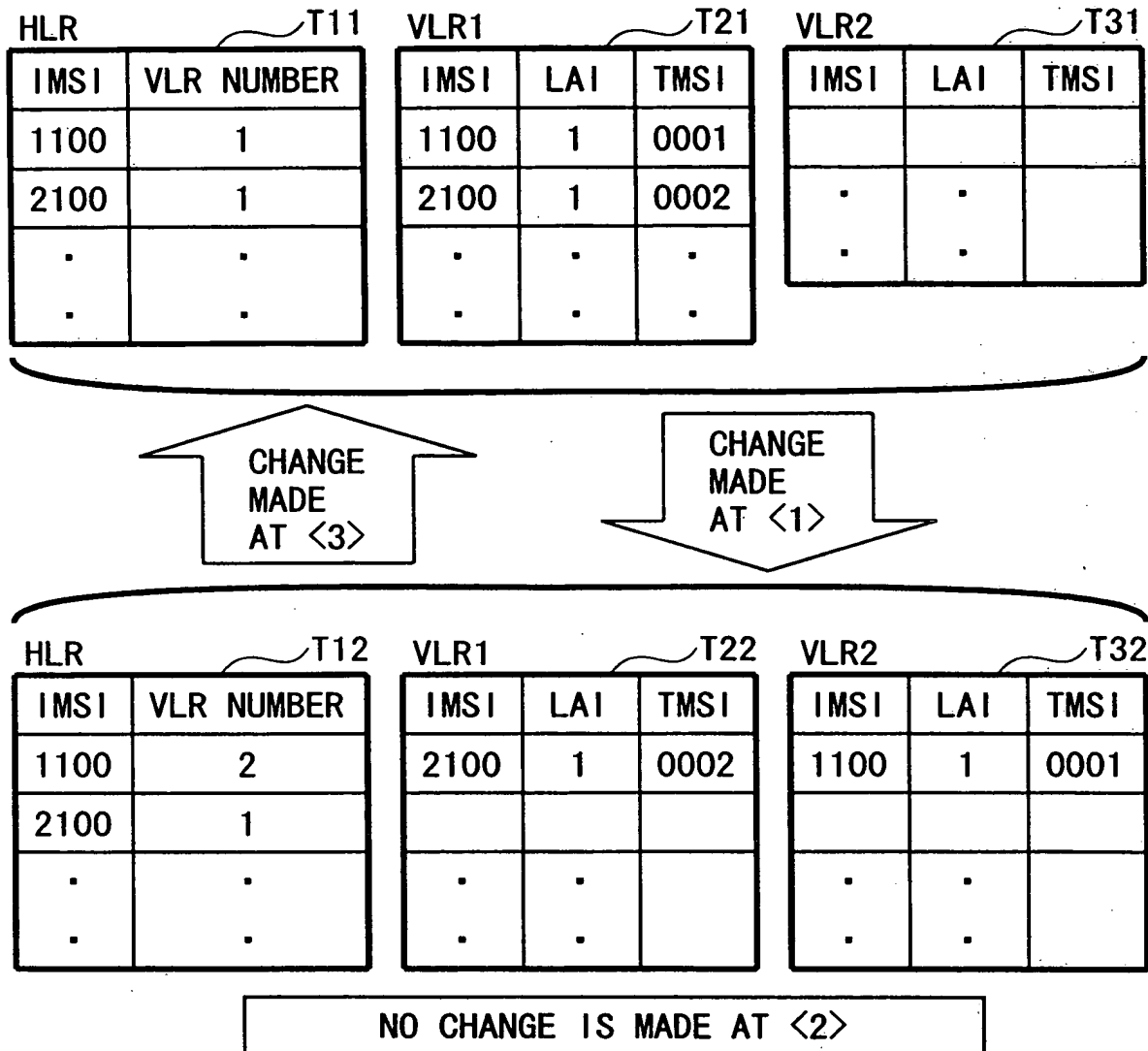


FIG. 28B

TERMINAL REGISTRATION TABLE

BTS	CELL-ID	IMSI	TMSI
NBTS1	1001	1100	0001
NBTS2	1002	2100	
NBTS3	1003		

FIG. 29A

HLR		VLR1			VLR2		
		T11			T21		
IMSI	VLR NUMBER	IMSI	LAI	TMSI	IMSI	LAI	TMSI
1100	1	1100	1	0001			
2100	1	2100	1	0002	.	.	
.	

NO CHANGE IS MADE AT <4>/<6>

CHANGE
MADE
AT <5>

HLR		VLR1			VLR2		
		T13			T23		
IMSI	VLR NUMBER	IMSI	LAI	TMSI	IMSI	LAI	TMSI
1100	2	1100	1	0001	2100	1	0001
2100	1						
.	
.	

FIG. 29B

TERMINAL REGISTRATION TABLE

BTS	CELL-ID	IMSI	TMSI
NBTS1	1001	1100	
NBTS2	1002	2100	0001
NBTS3	1003		

6

FIG. 30

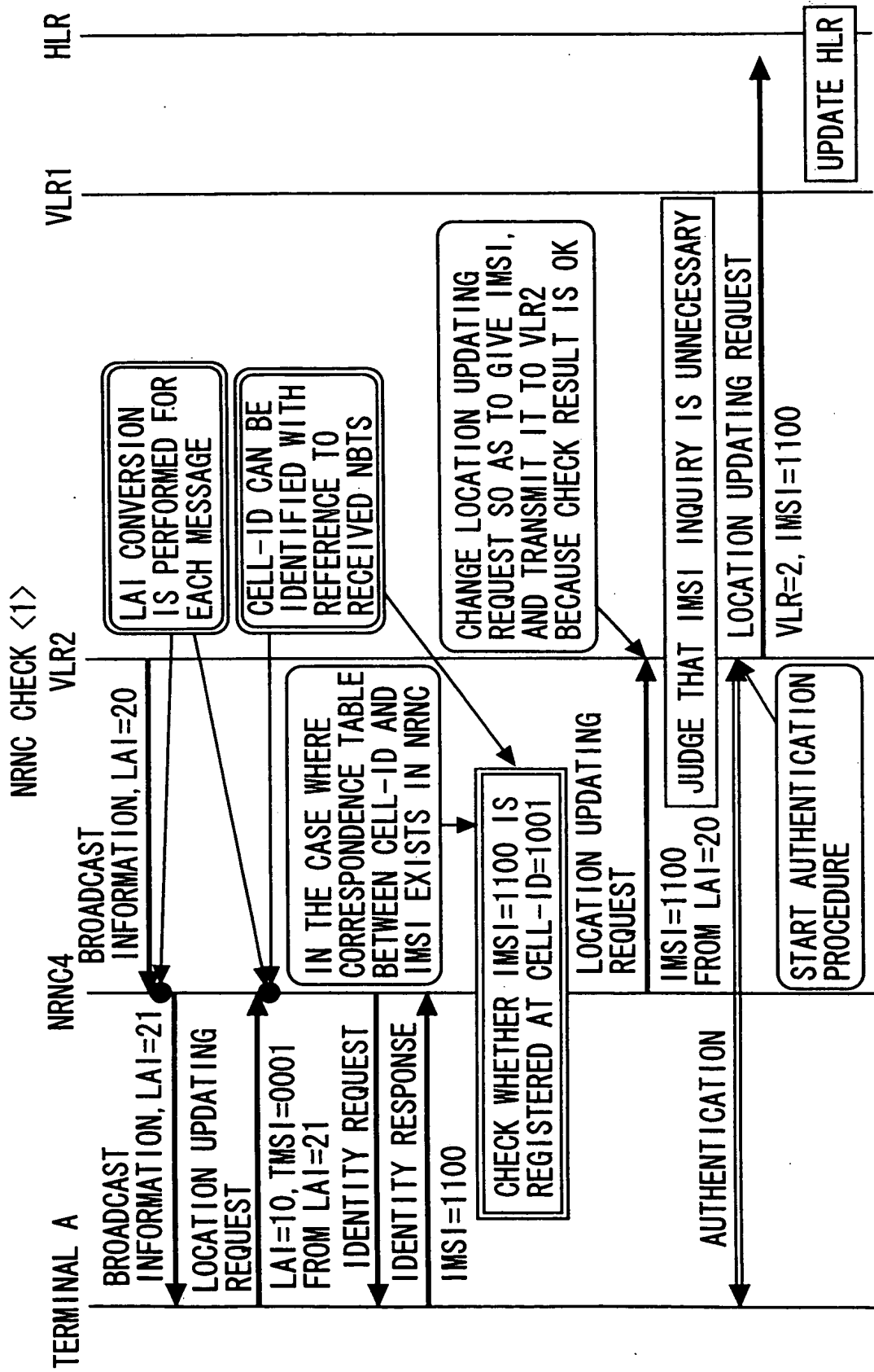


FIG. 31

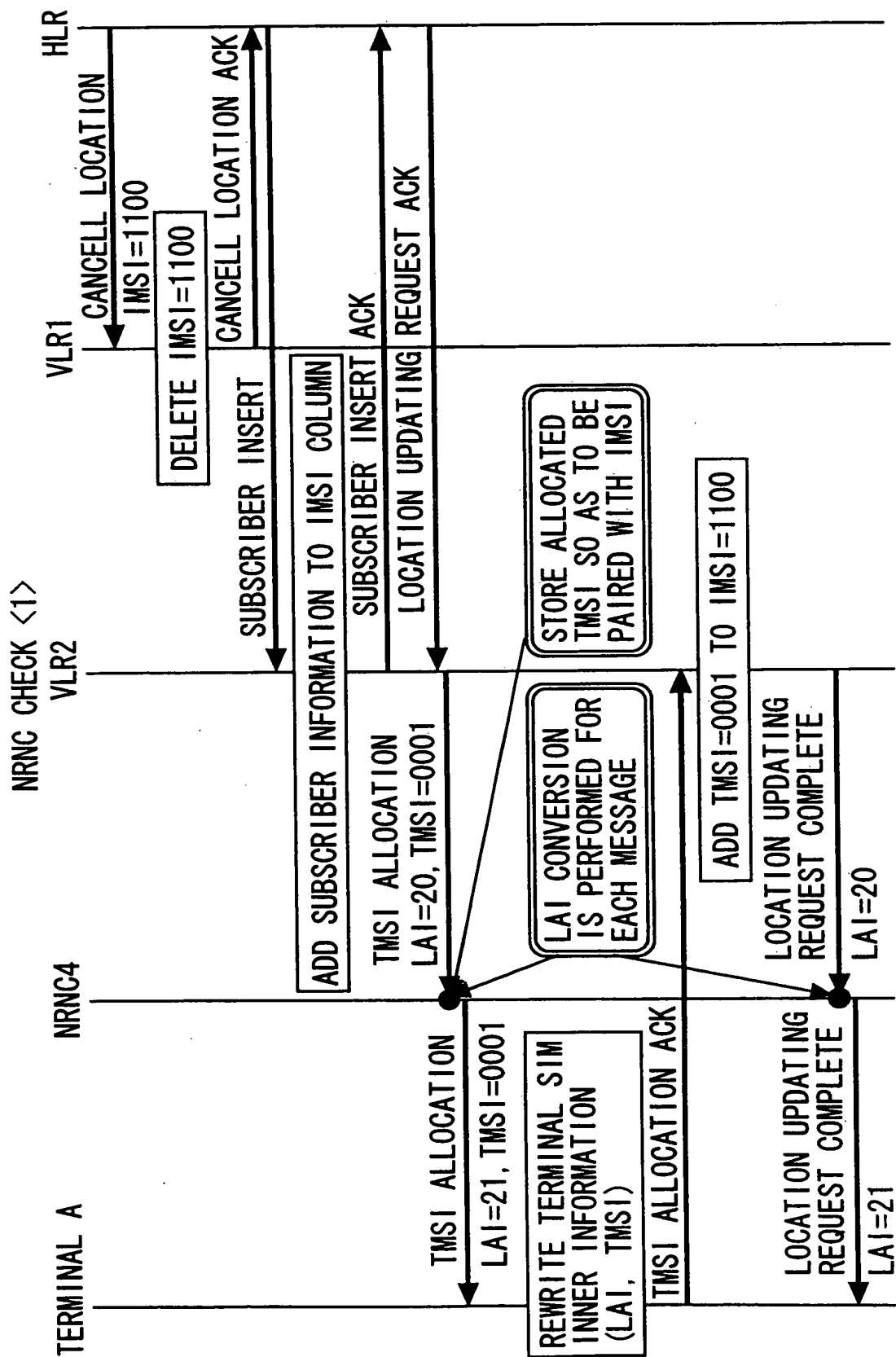


FIG. 32

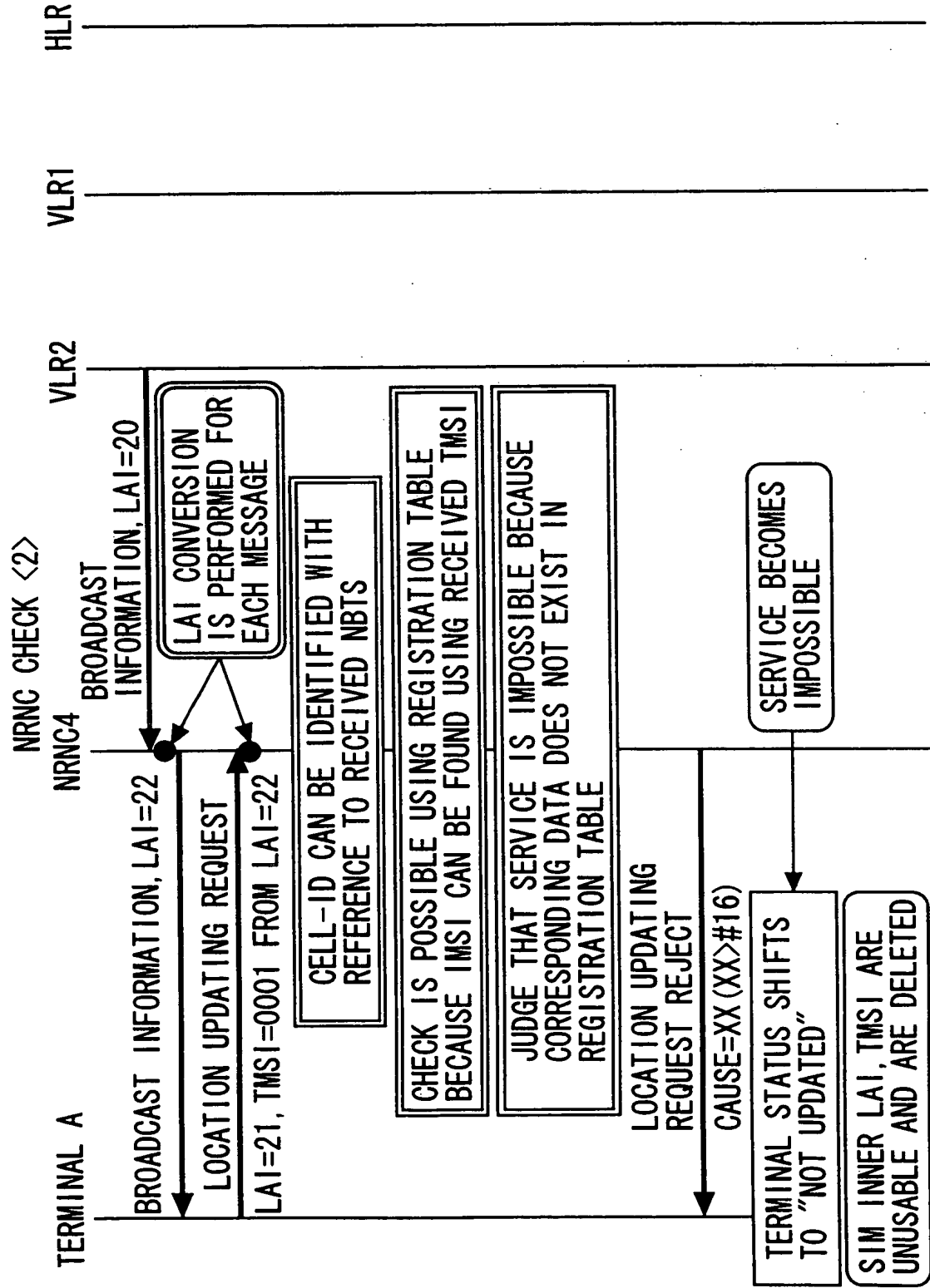


FIG. 33

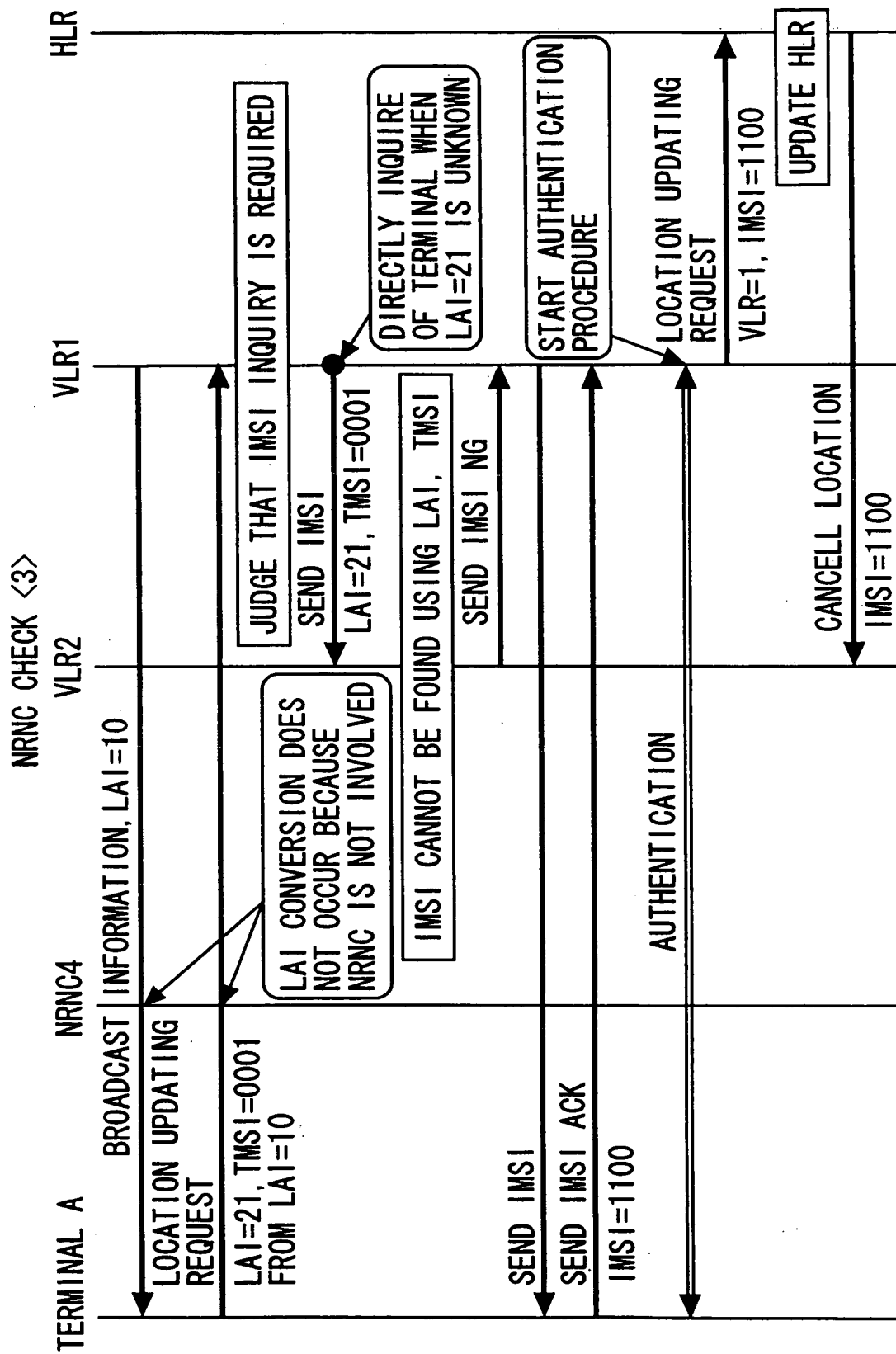


FIG. 34

NRNC CHECK <3>

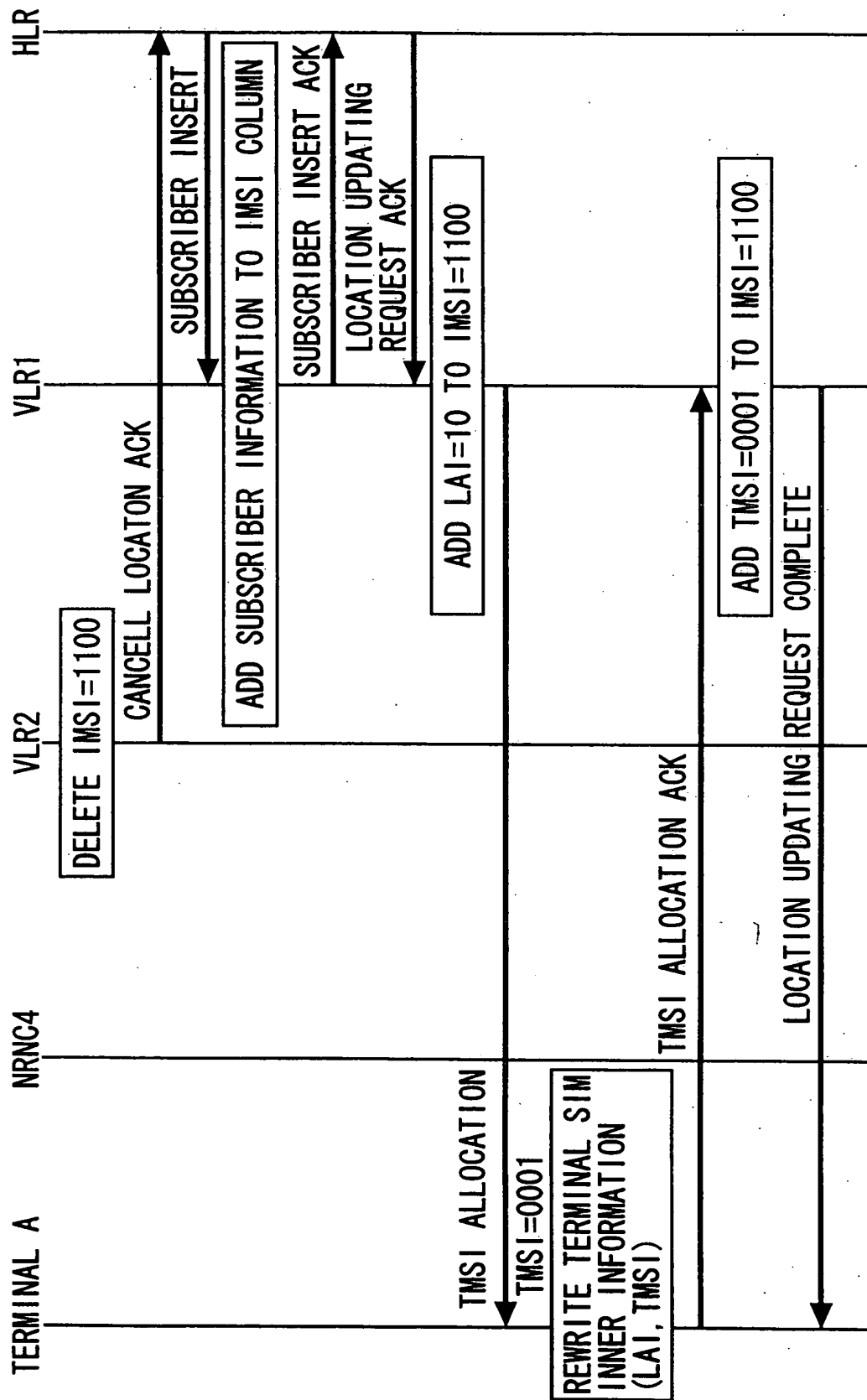


FIG. 35

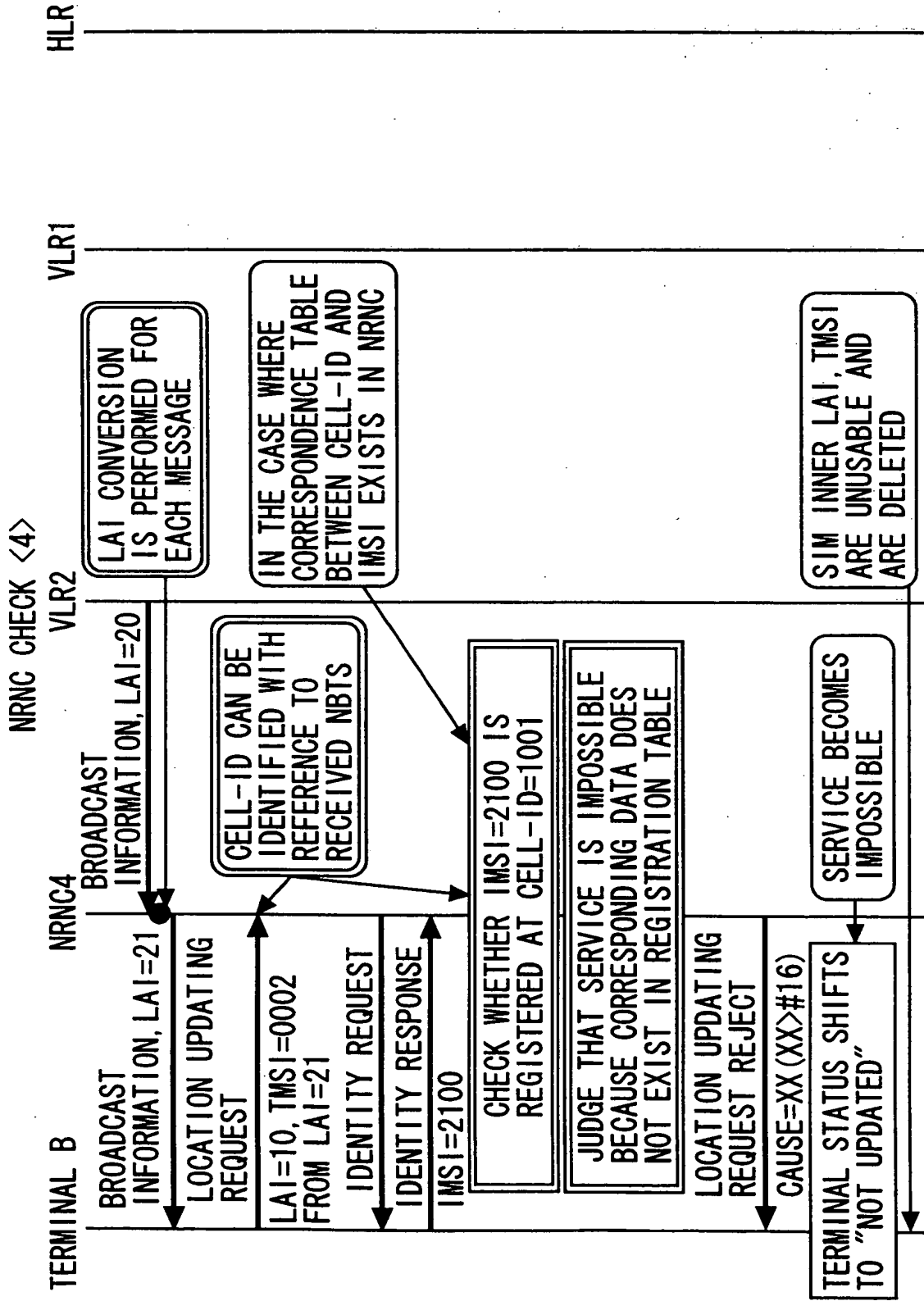


FIG. 36A

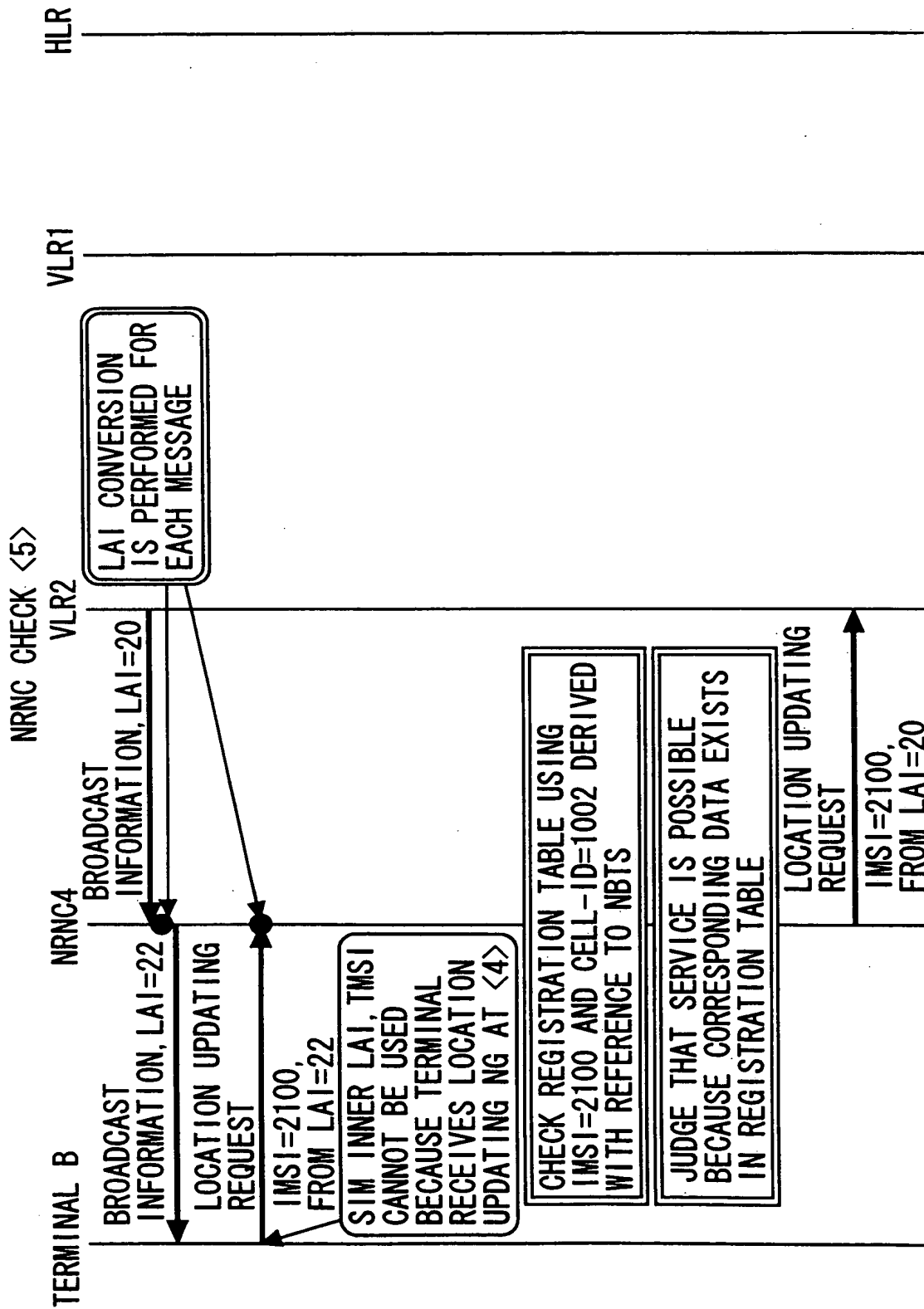


FIG. 36B

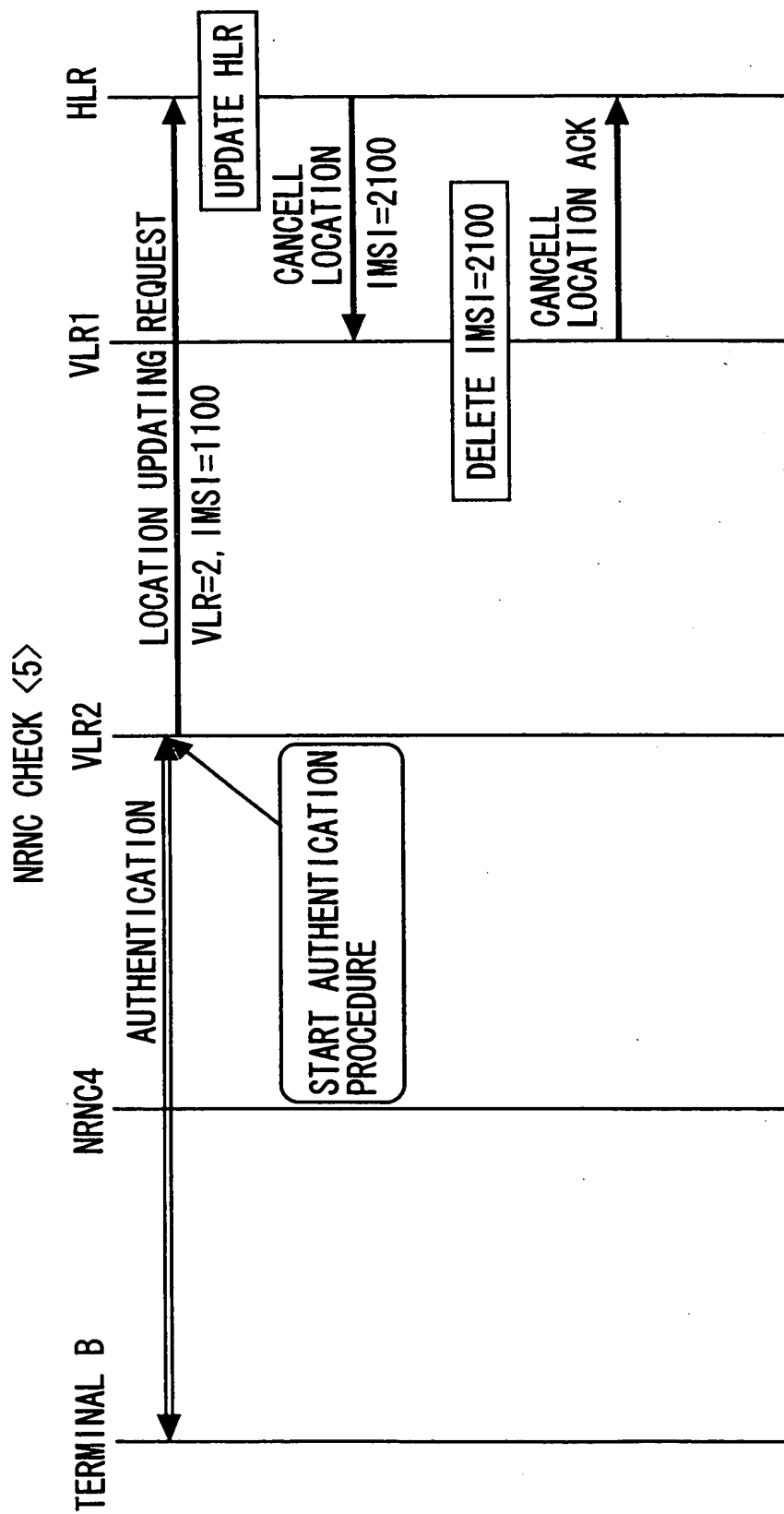


FIG. 37

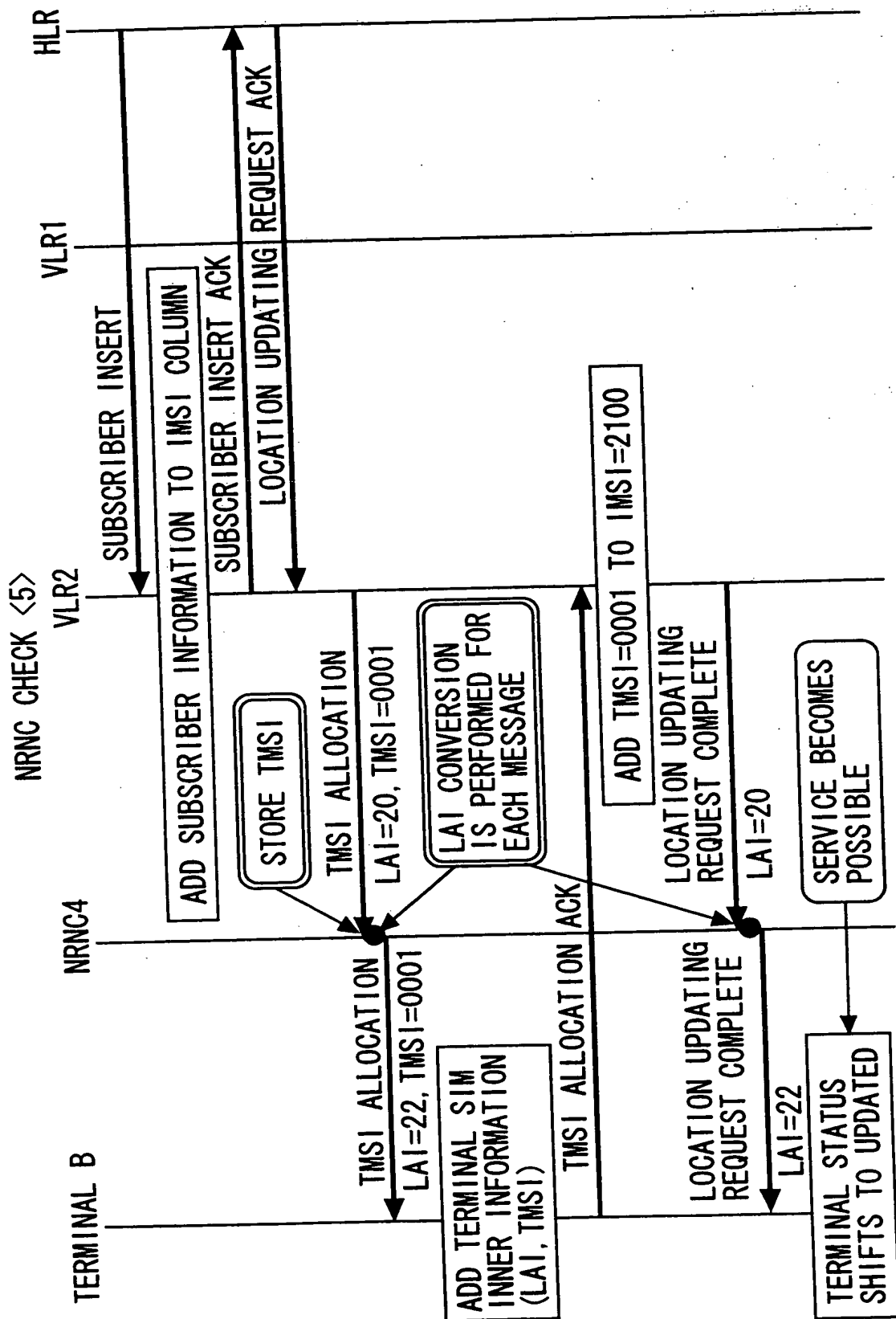


FIG. 38

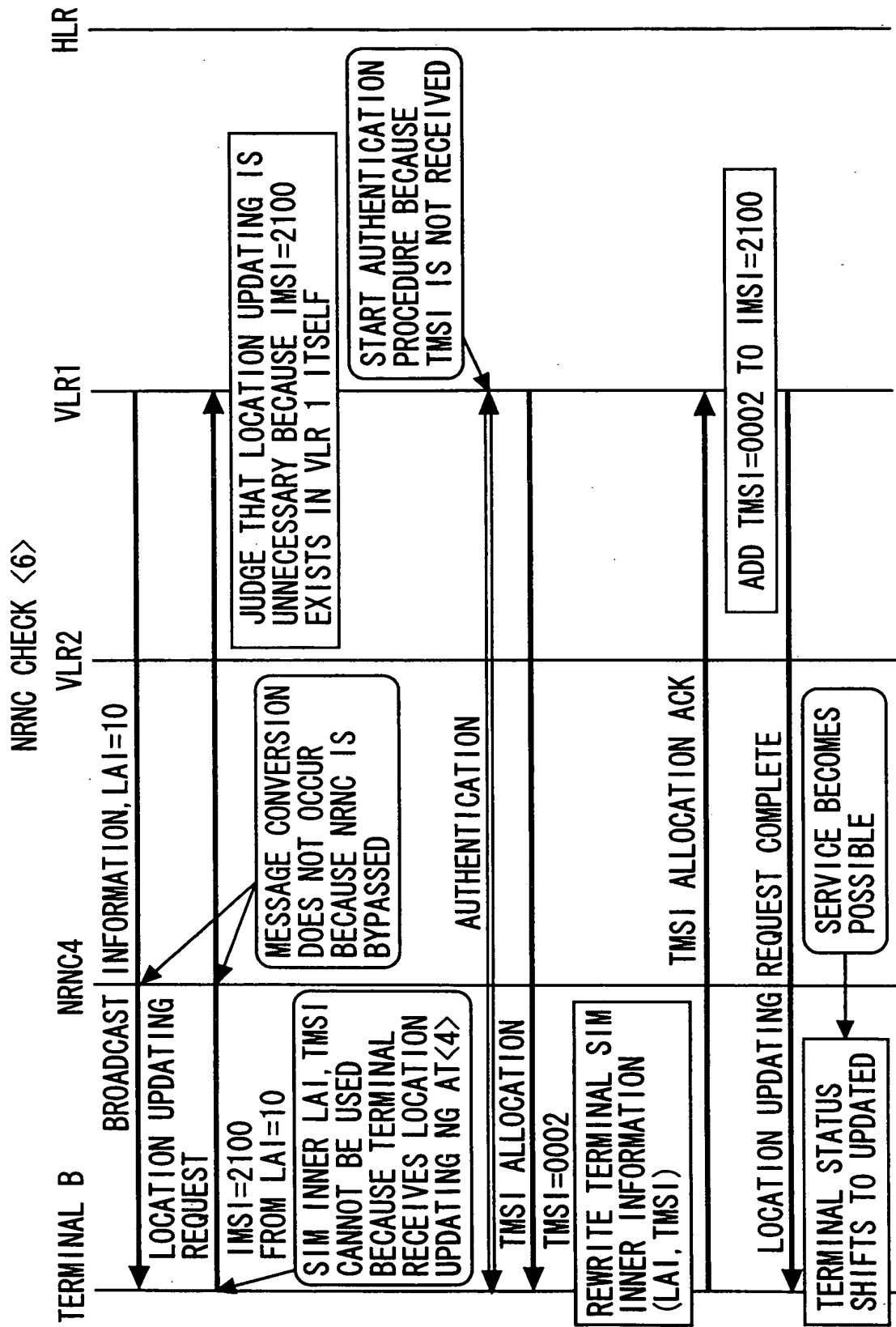


FIG. 39
PRIOR ART

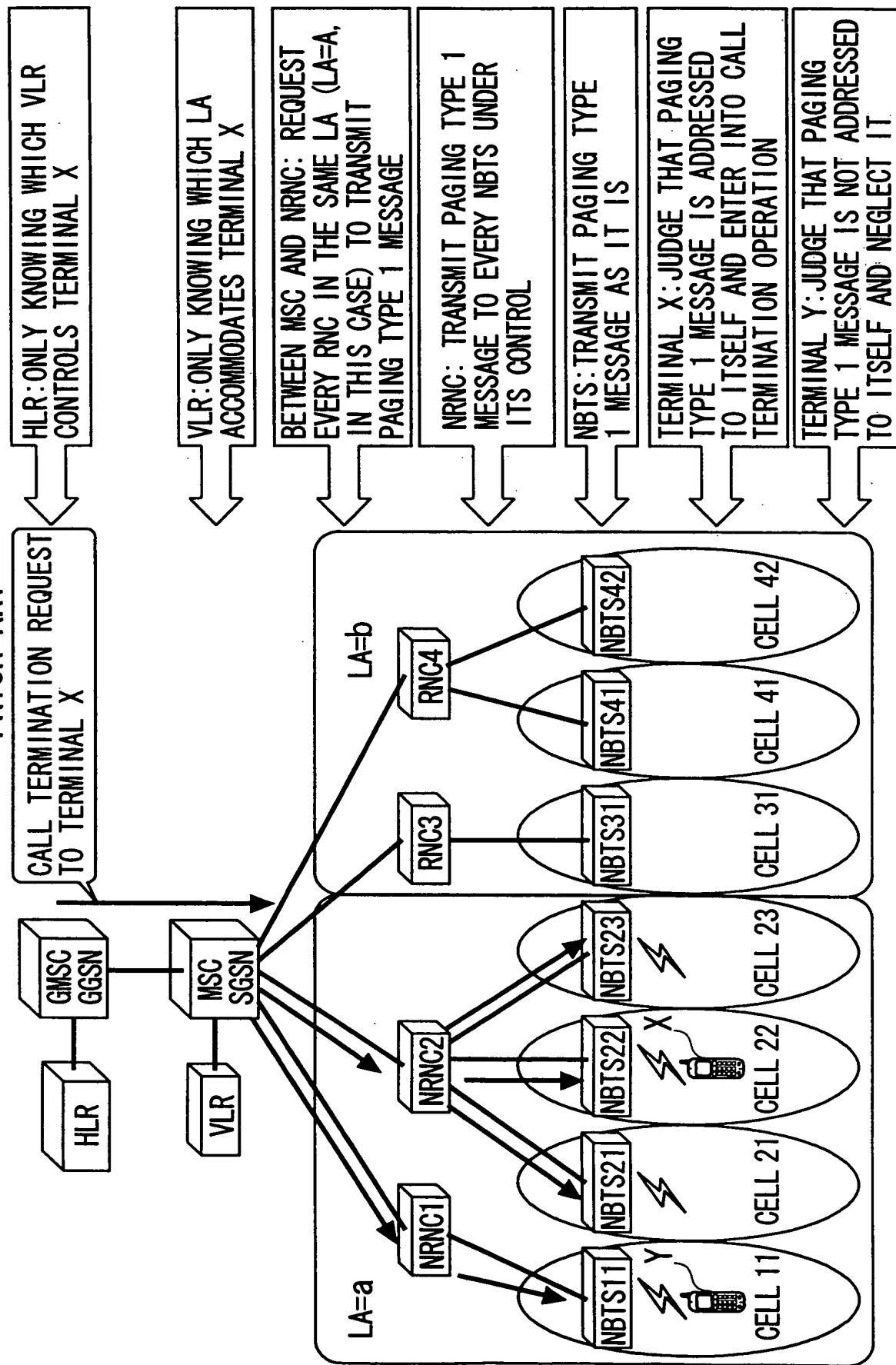


FIG. 40

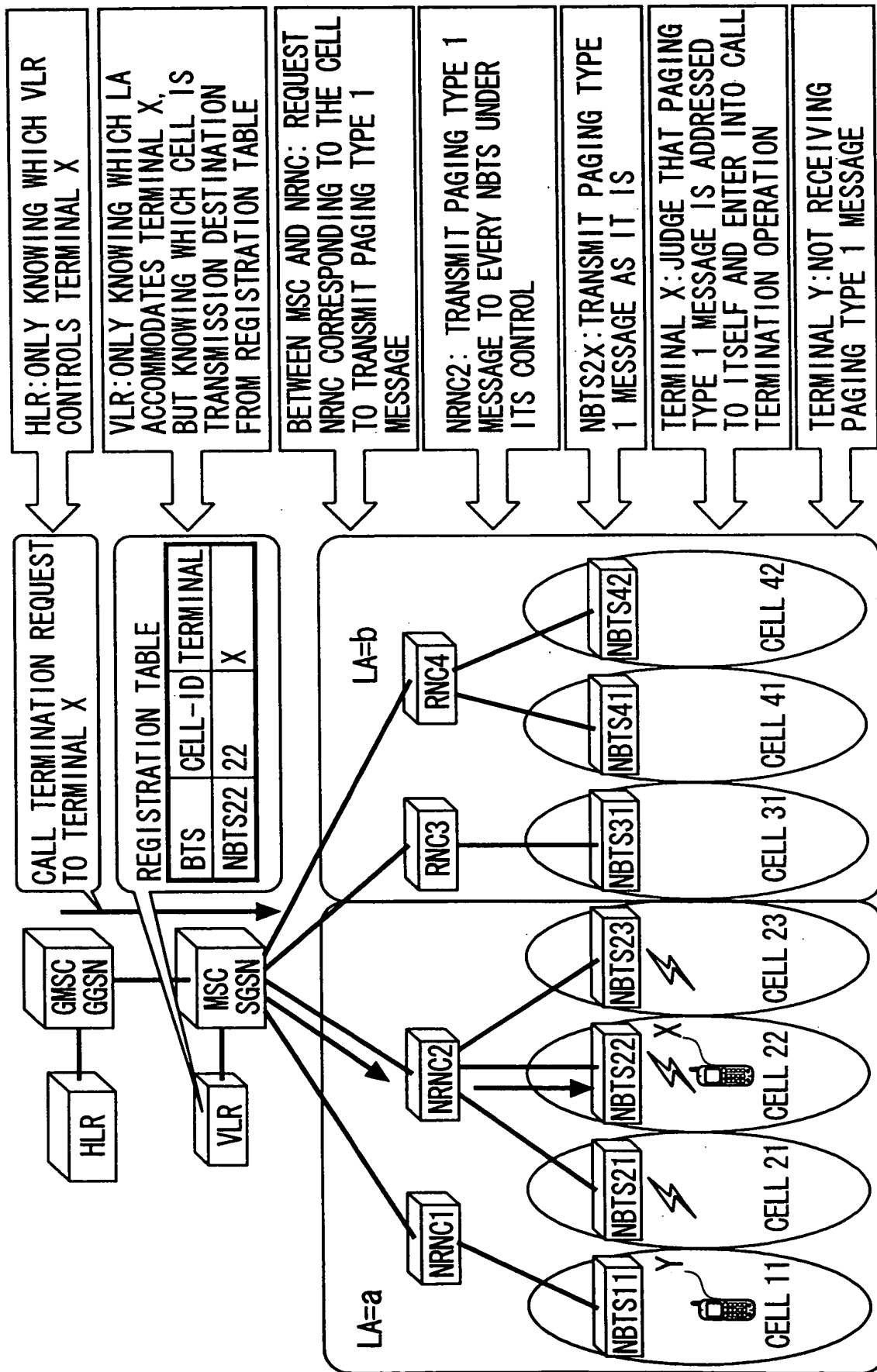


FIG. 41

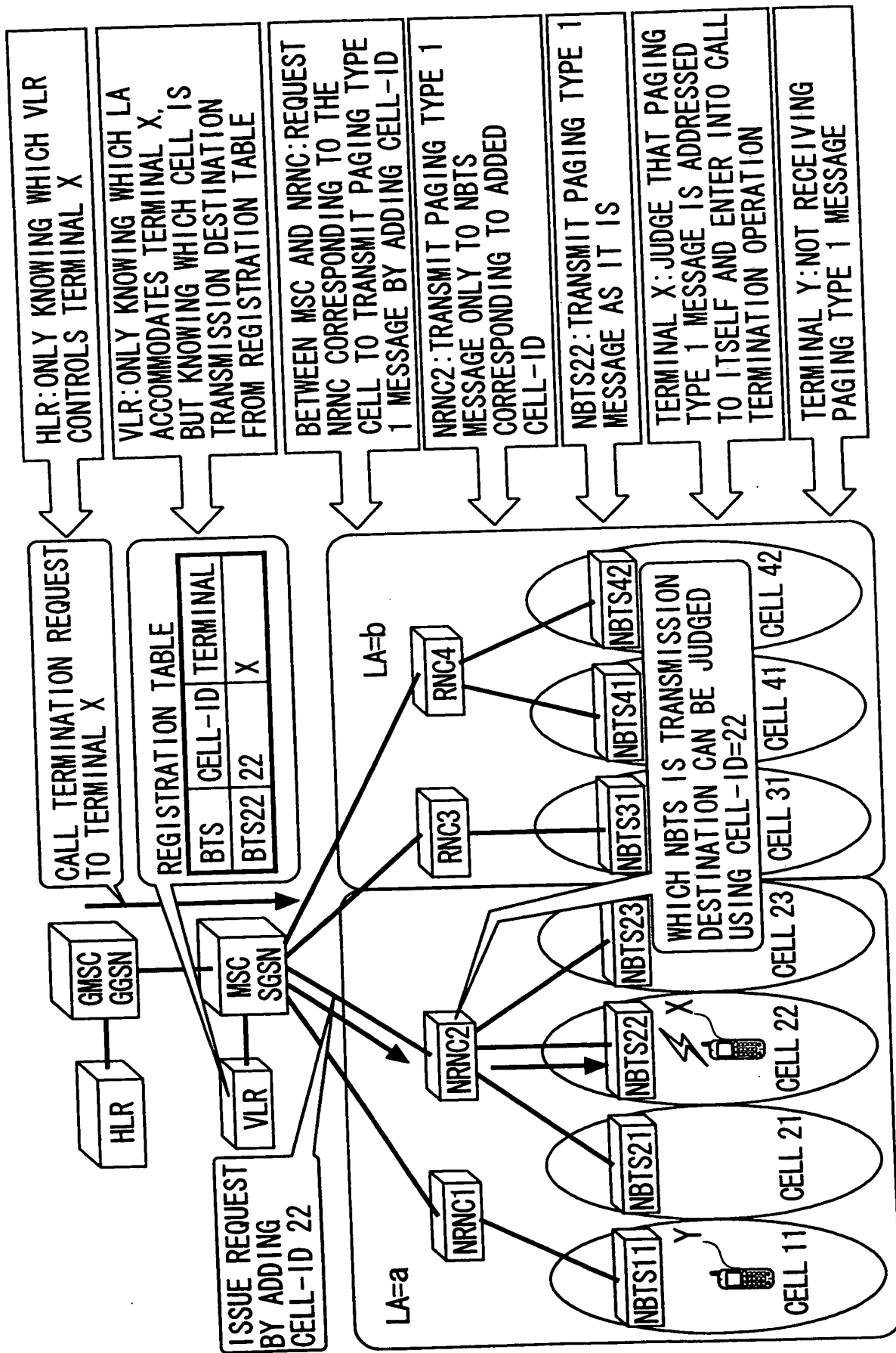


FIG. 42

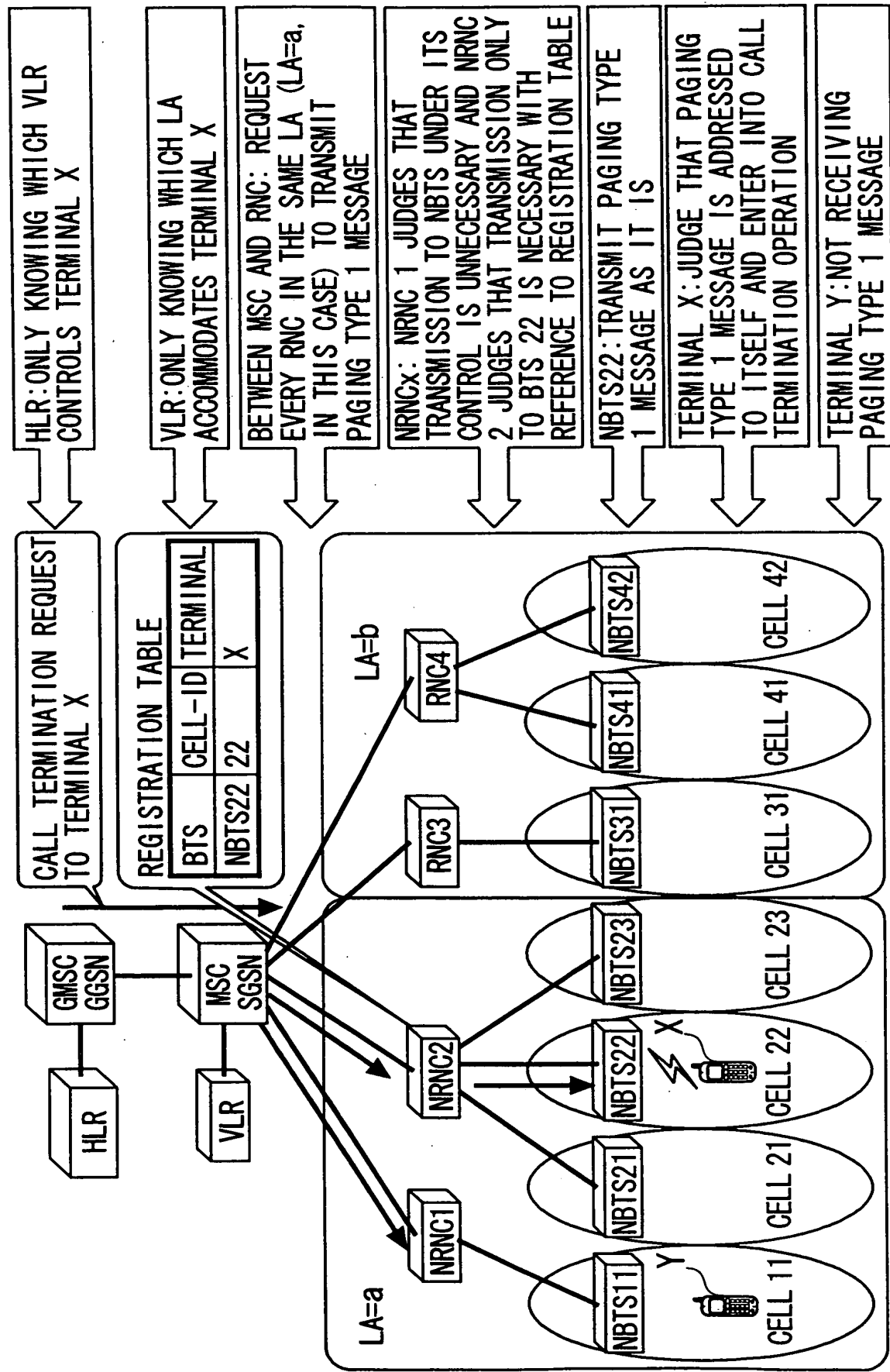


FIG. 43A

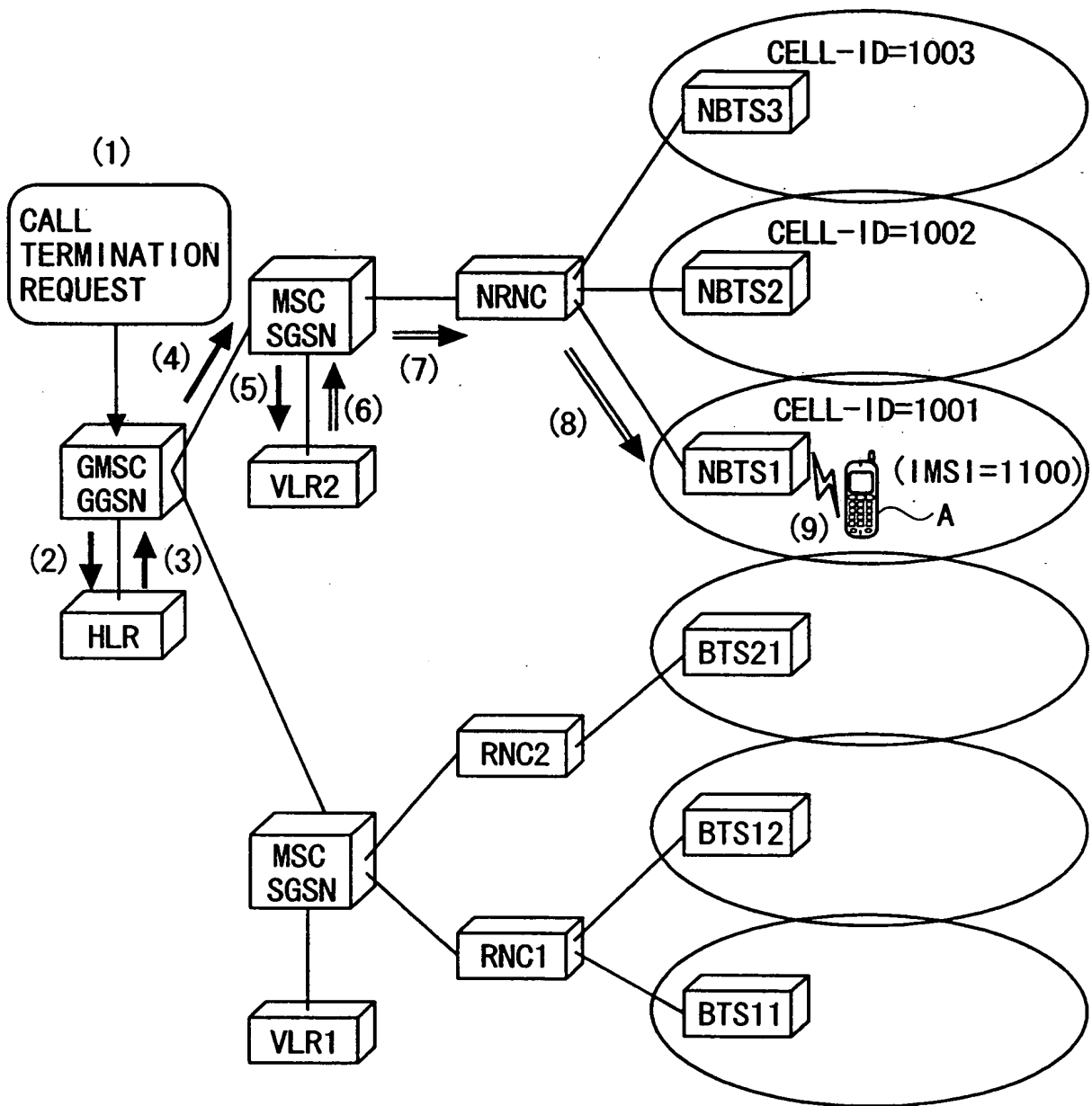


FIG. 43B

BTS	CELL-ID	IMSI	
NBTS1	1001	1100	(MULTIPLE IS POSSIBLE)
NBTS2	1002	2100	

EXISTING
IN VLR 2

FIG. 44A

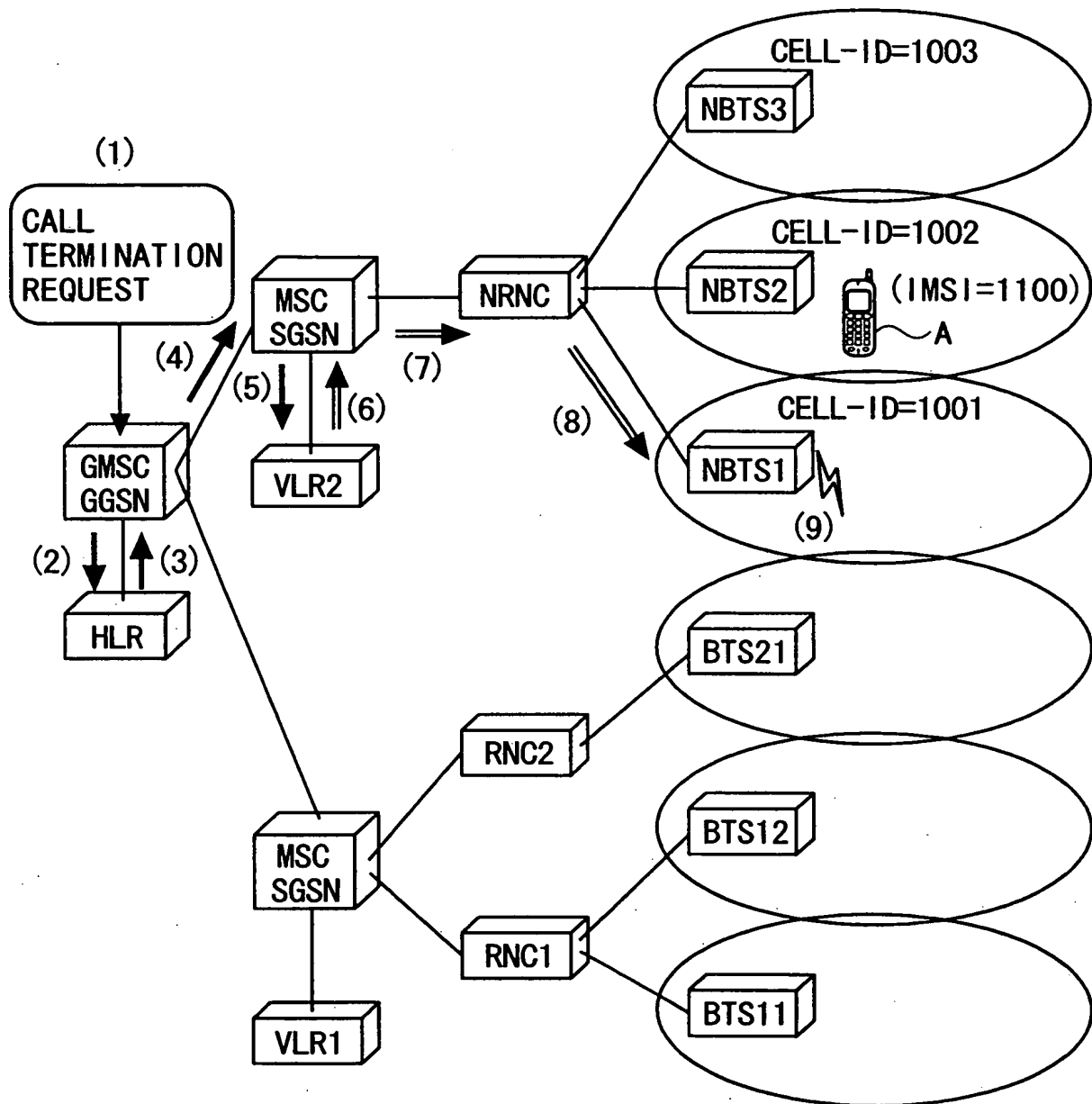


FIG. 44B

BTS	CELL-ID	IMSI	
NBTS1	1001	1100	(MULTIPLE IS POSSIBLE)
NBTS2	1002	2100	

EXISTING
IN VLR 2

FIG. 45A

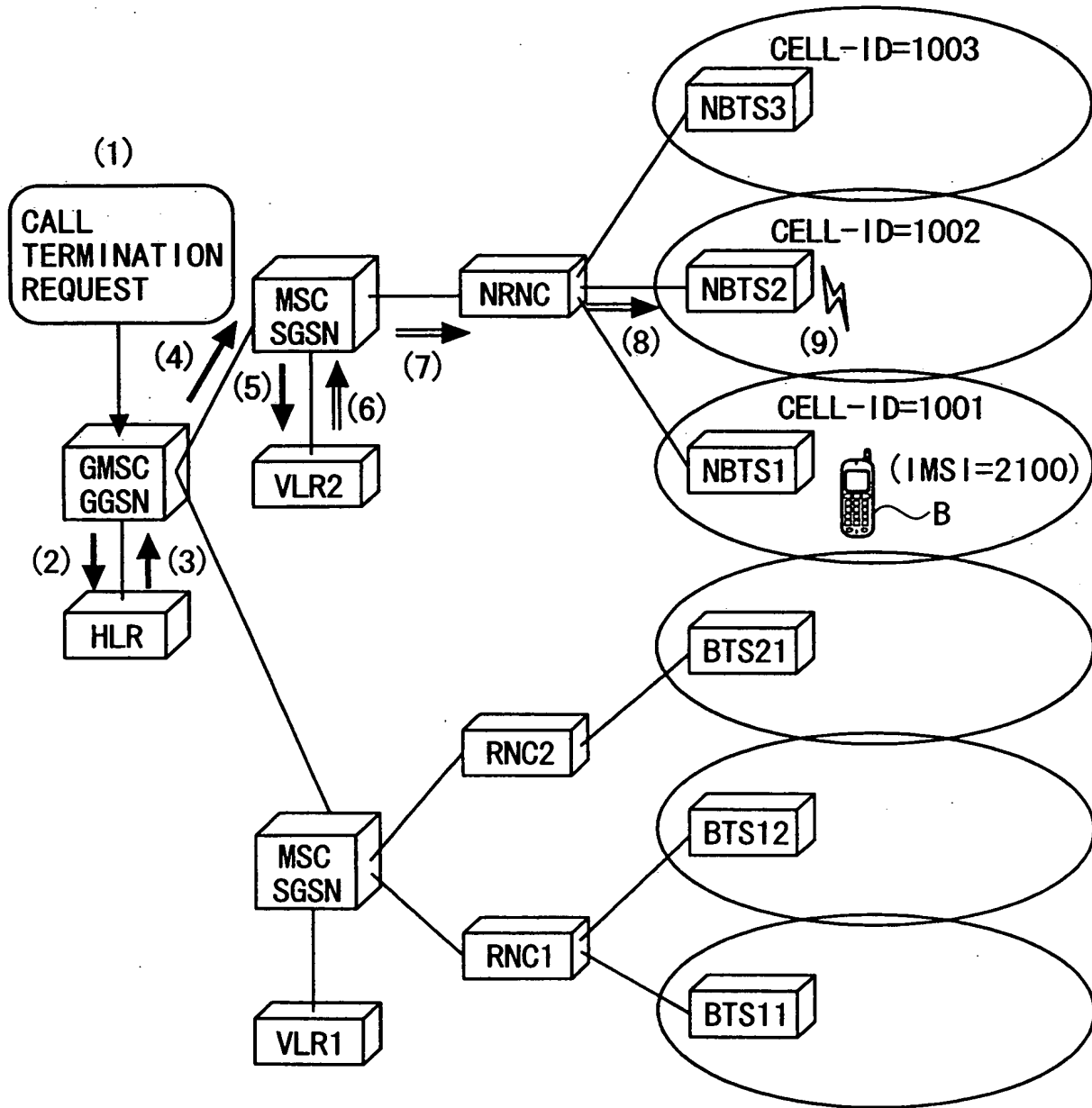


FIG. 45B

BTS	CELL-ID	IMSI	
NBTS1	1001	1100	(MULTIPLE IS POSSIBLE)
NBTS2	1002	2100	

EXISTING
IN VLR 2

FIG. 46A

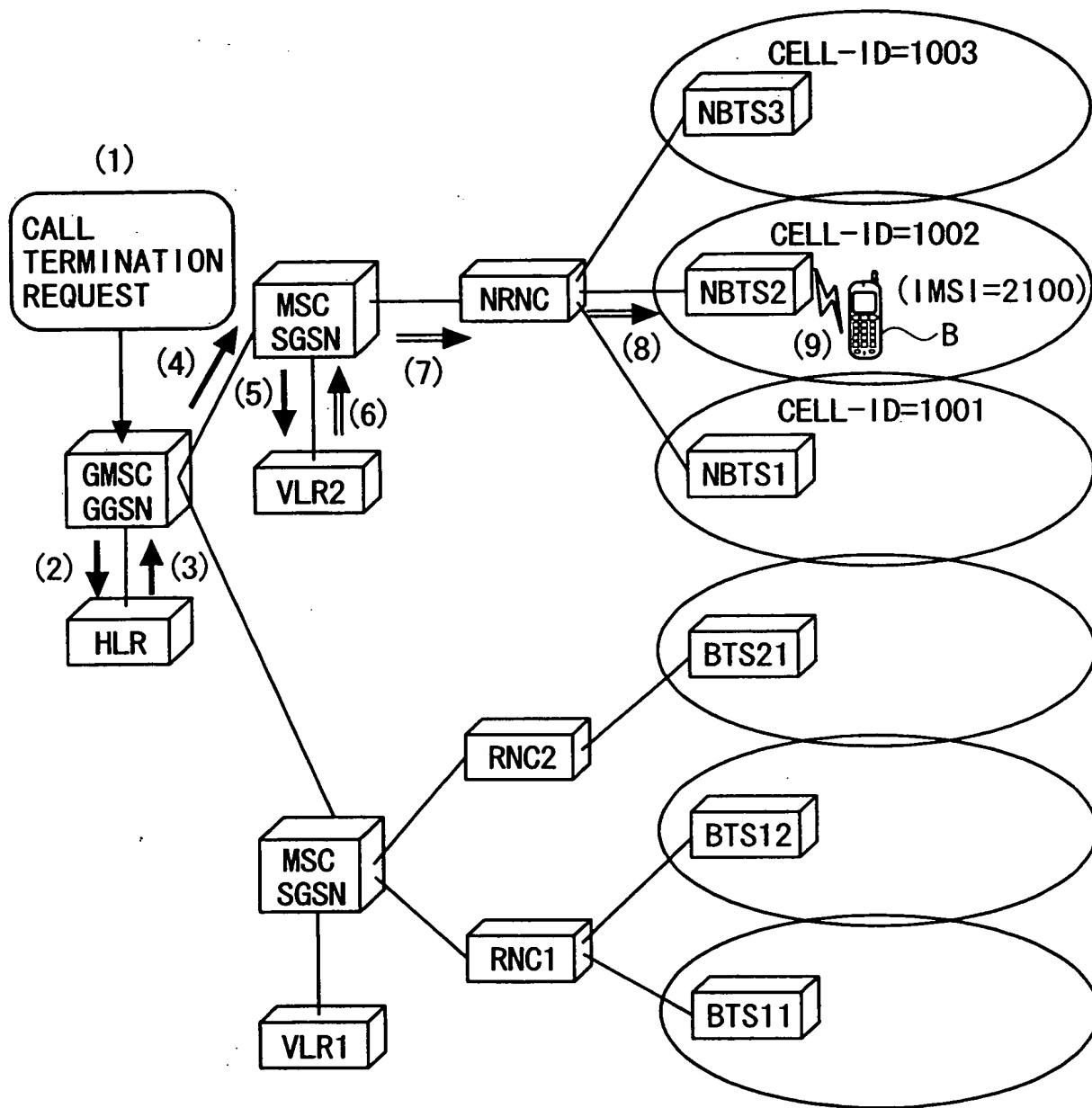


FIG. 46B

BTS	CELL-ID	IMSI	
NBTS1	1001	1100	(MULTIPLE IS POSSIBLE)
NBTS2	1002	2100	

EXISTING IN VLR 2

FIG. 47A

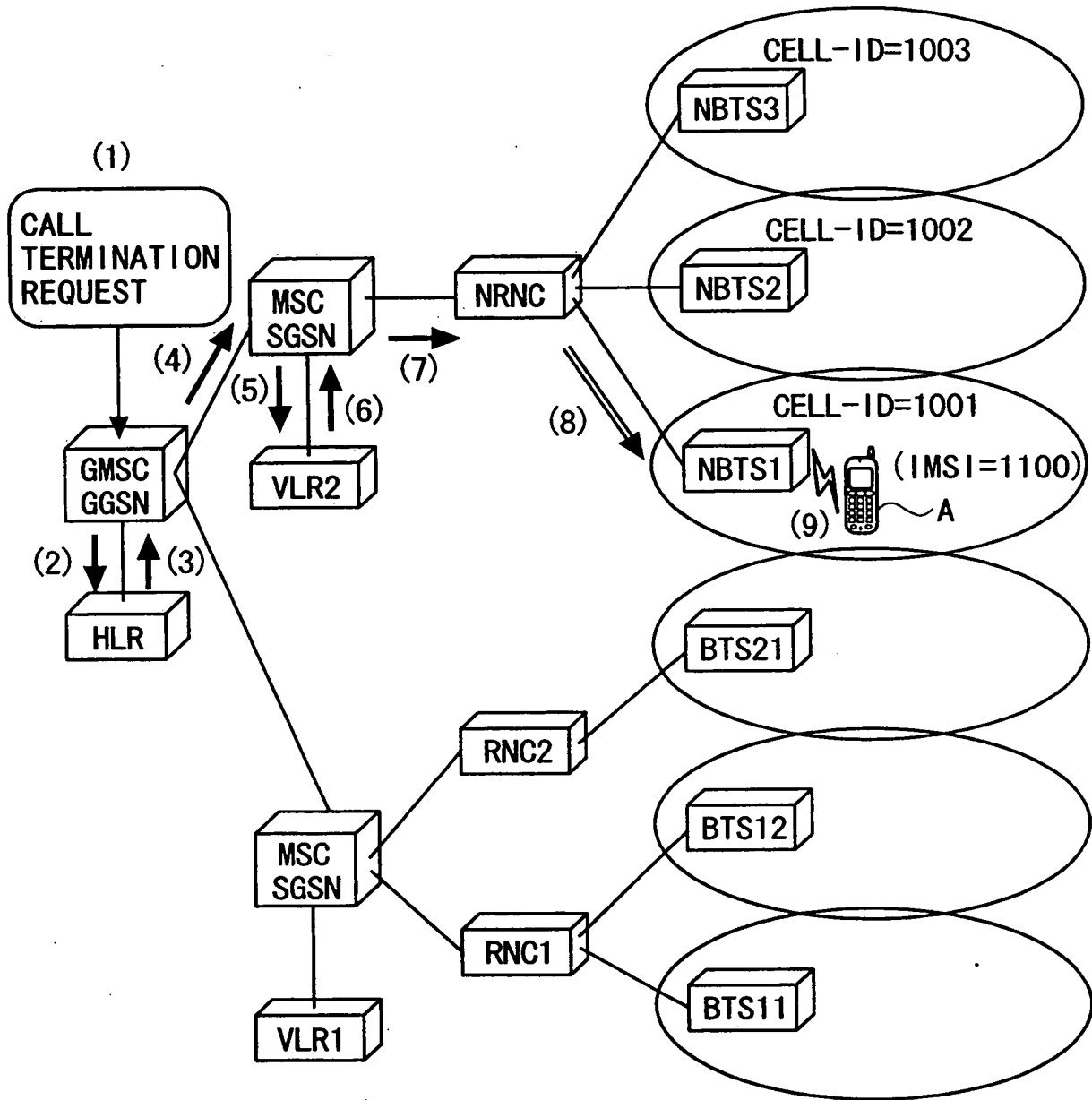


FIG. 47B

BTS	CELL-ID	IMSI	
NBTS1	1001	1100	(MULTIPLE IS POSSIBLE)
NBTS2	1002	2100	

EXISTING
IN NRNC

FIG. 48A

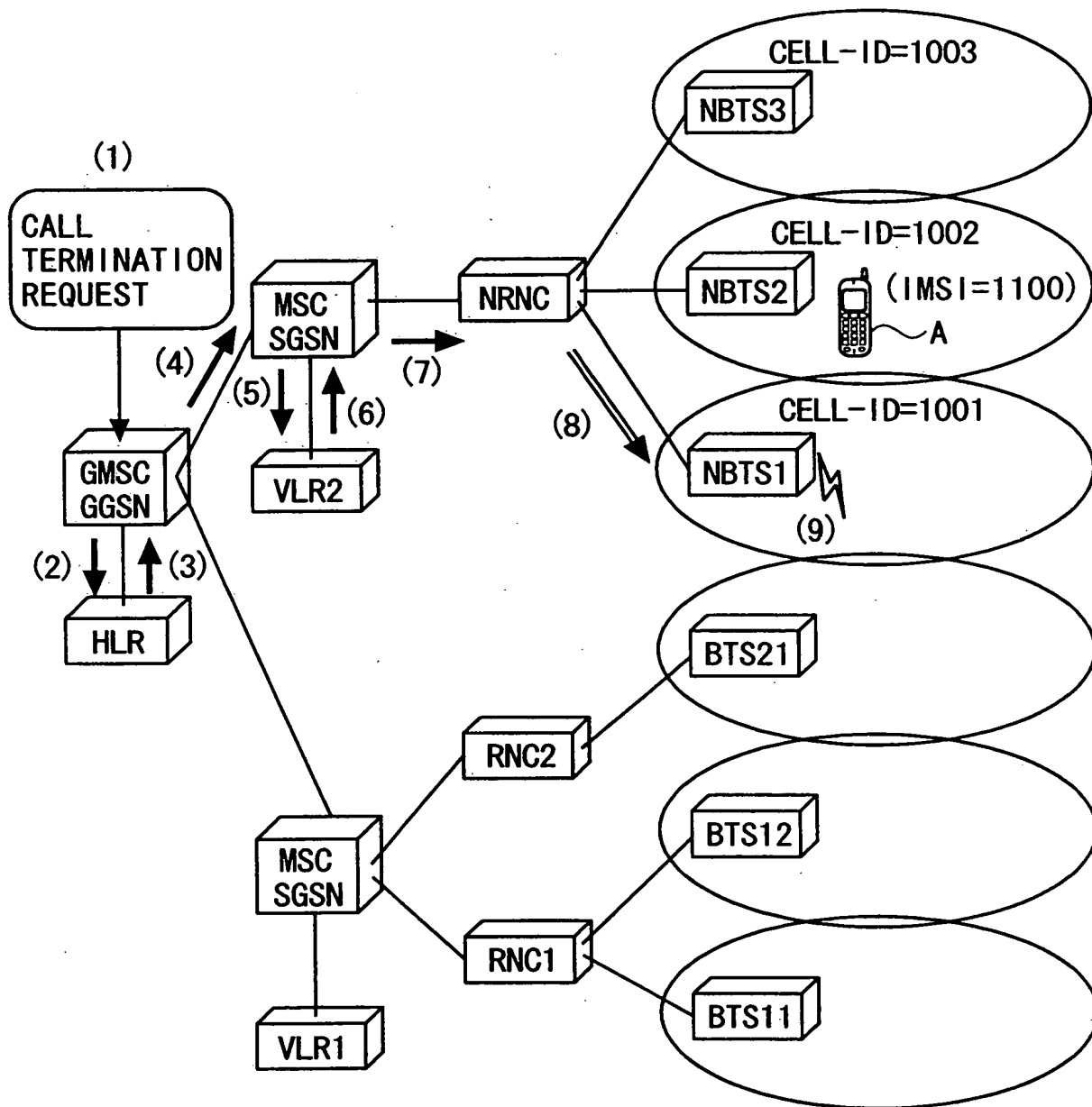


FIG. 48B

BTS	CELL-ID	IMSI	
NBTS1	1001	1100	(MULTIPLE IS POSSIBLE)
NBTS2	1002	2100	

EXISTING
IN NRNC

FIG. 49A

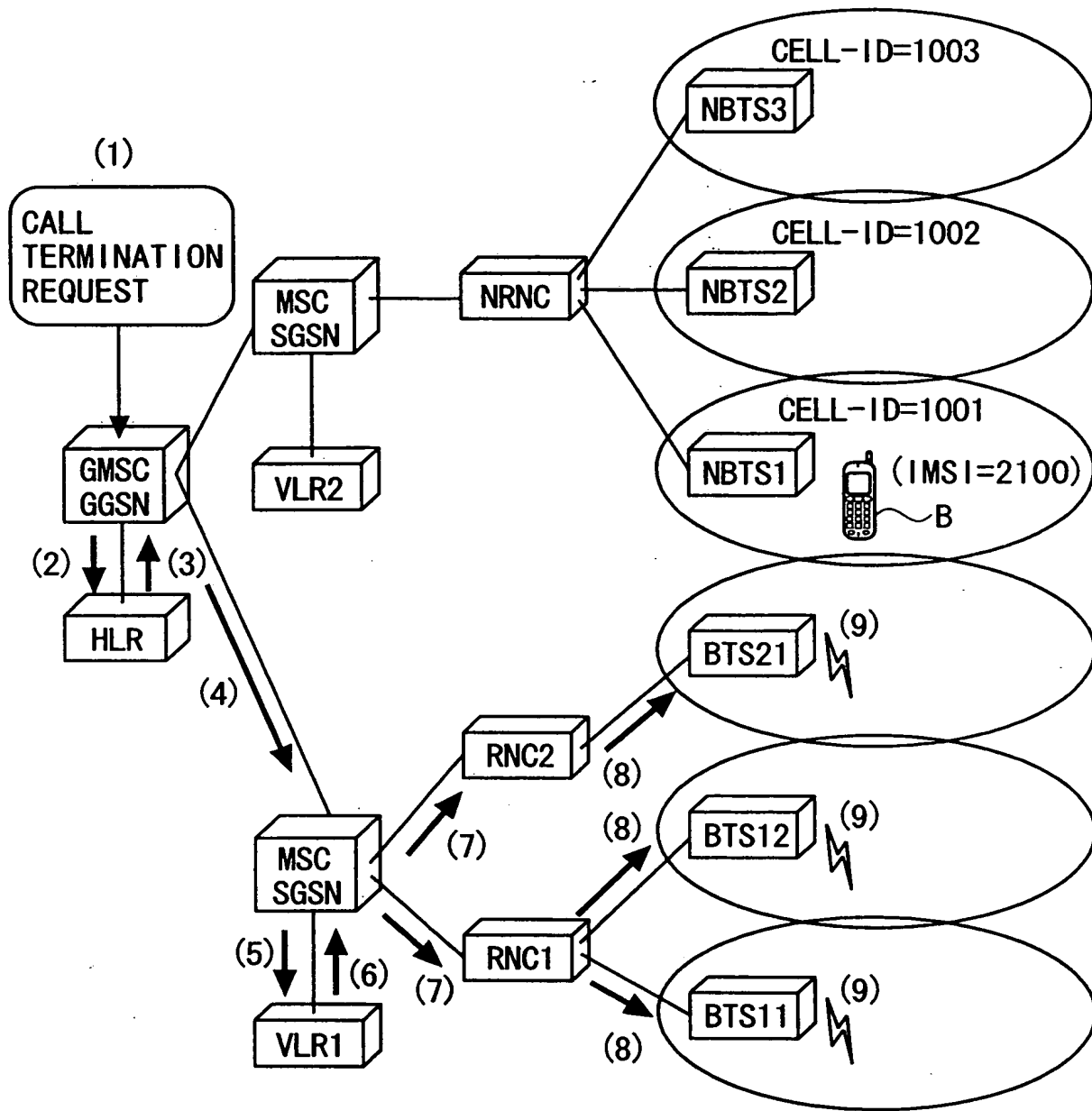


FIG. 49B

BTS	CELL-ID	IMSI	
NBTS1	1001	1100	(MULTIPLE IS POSSIBLE)
NBTS2	1002	2100	

EXISTING IN NRNC

FIG. 50A

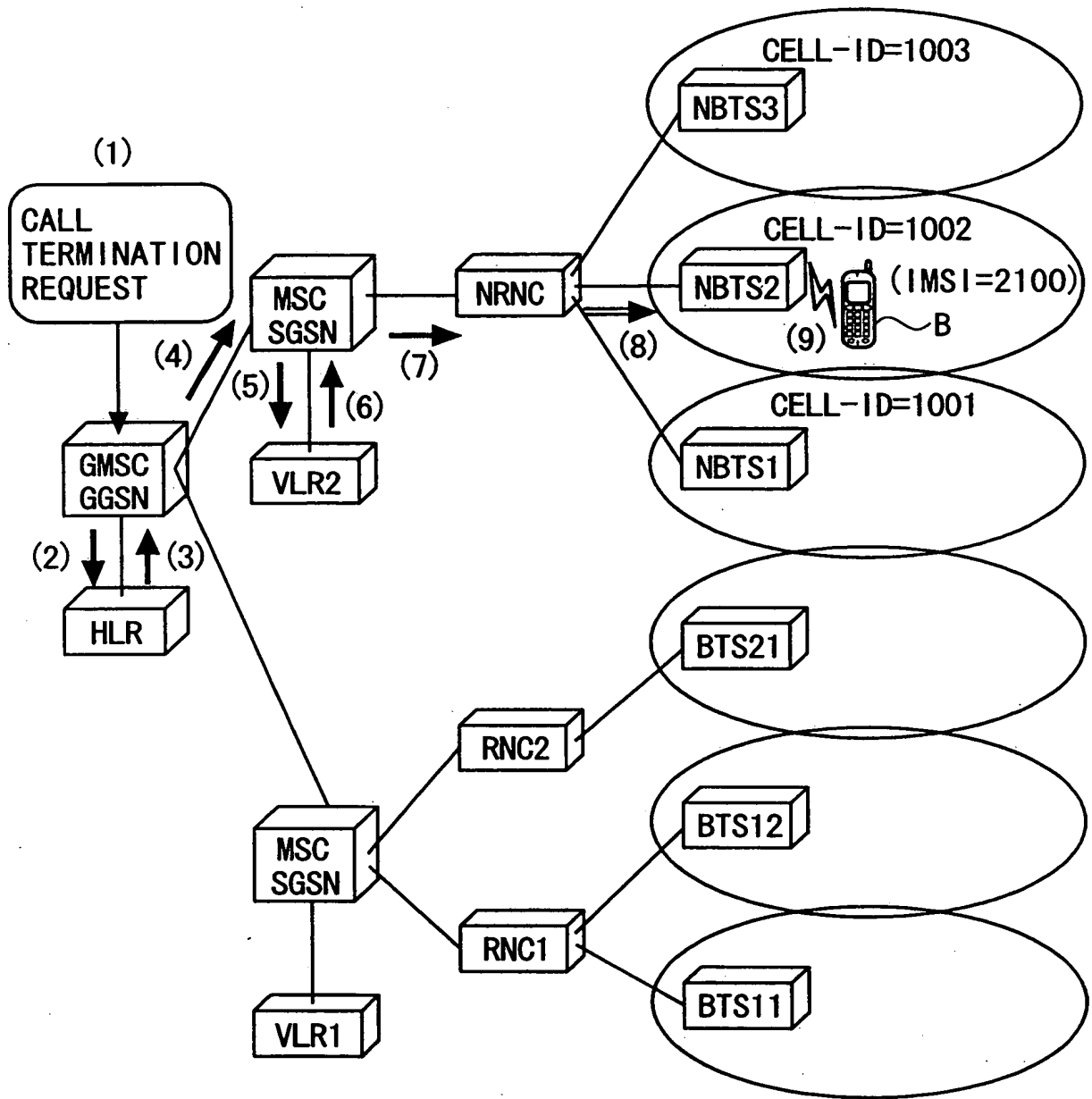


FIG. 50B

BTS	CELL-ID	IMSI	EXISTING IN NRNC
NBTS1	1001	1100	
NBTS2	1002	2100	

FIG. 51

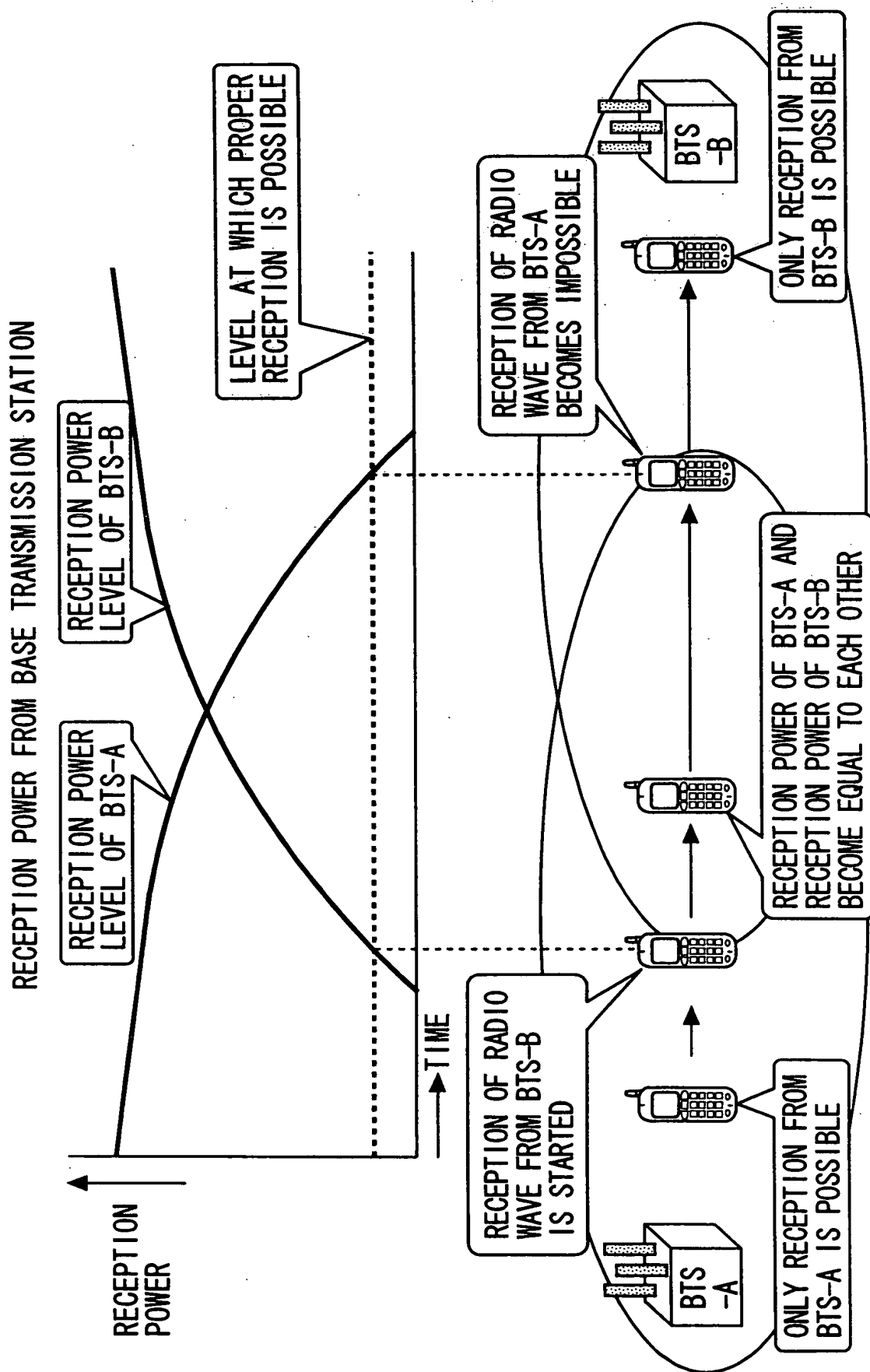


FIG. 52

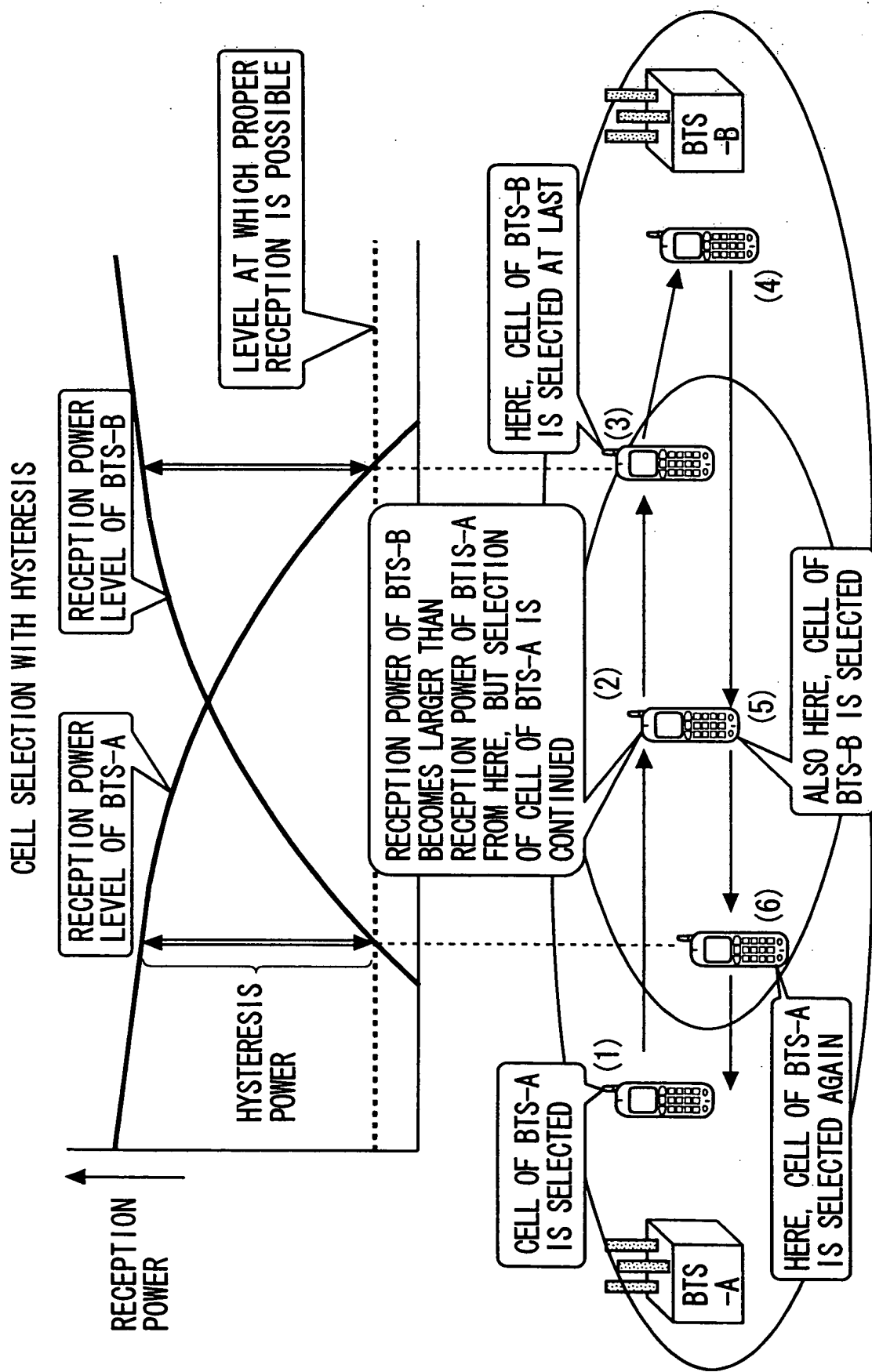


FIG. 53

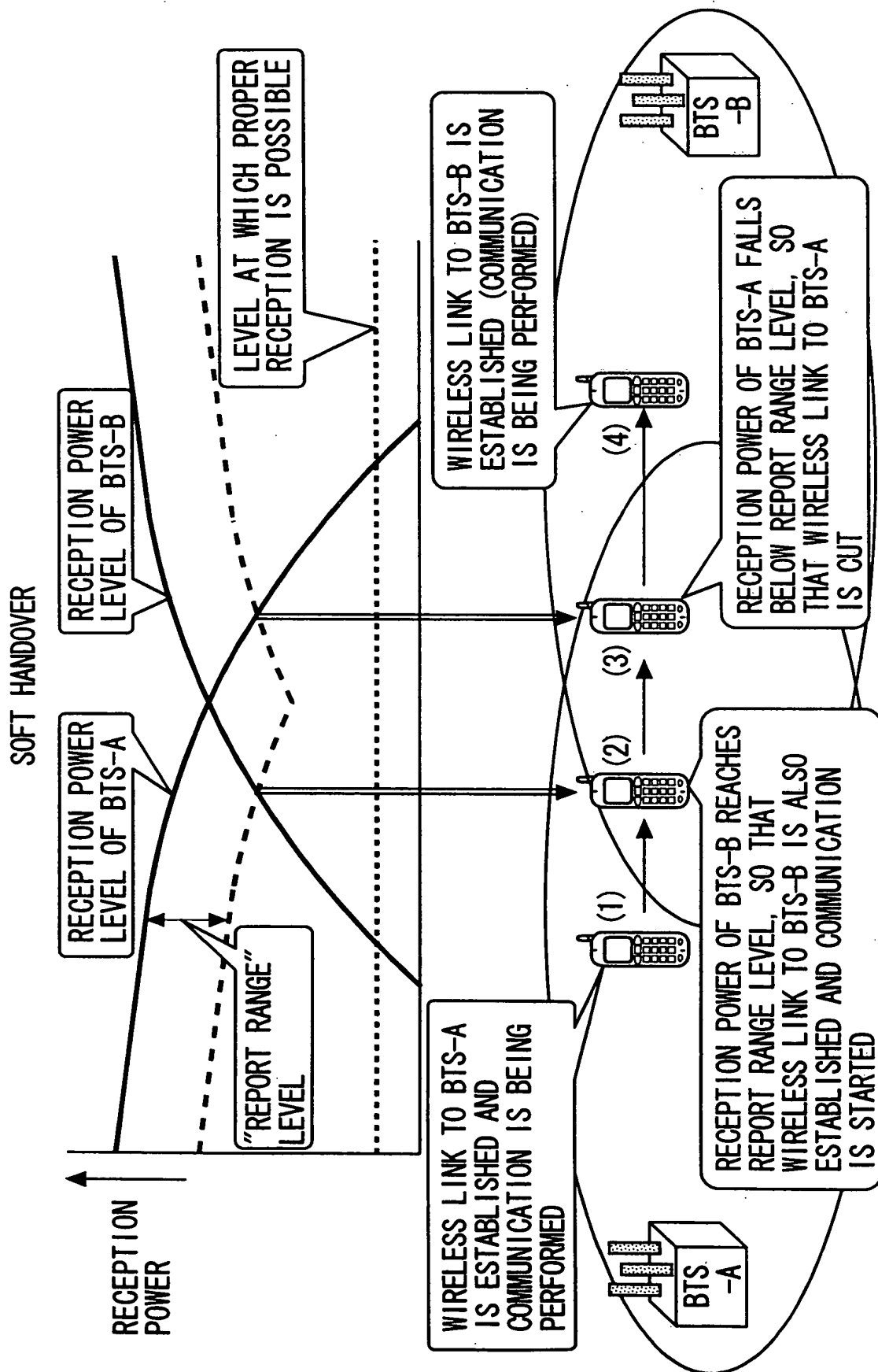


FIG. 54

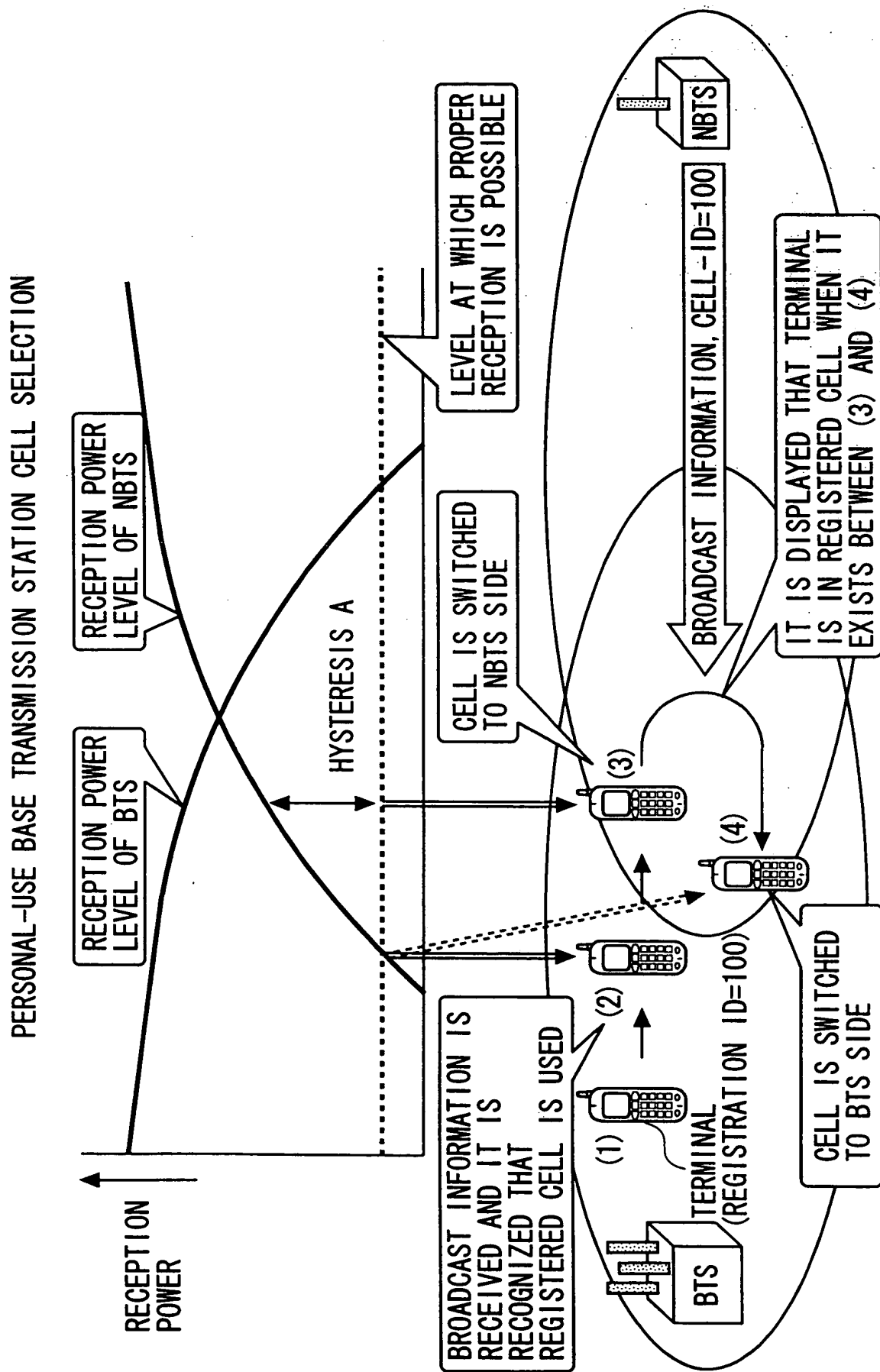


FIG. 55A

SEQUENCE OF ORDINARY HANDOVER

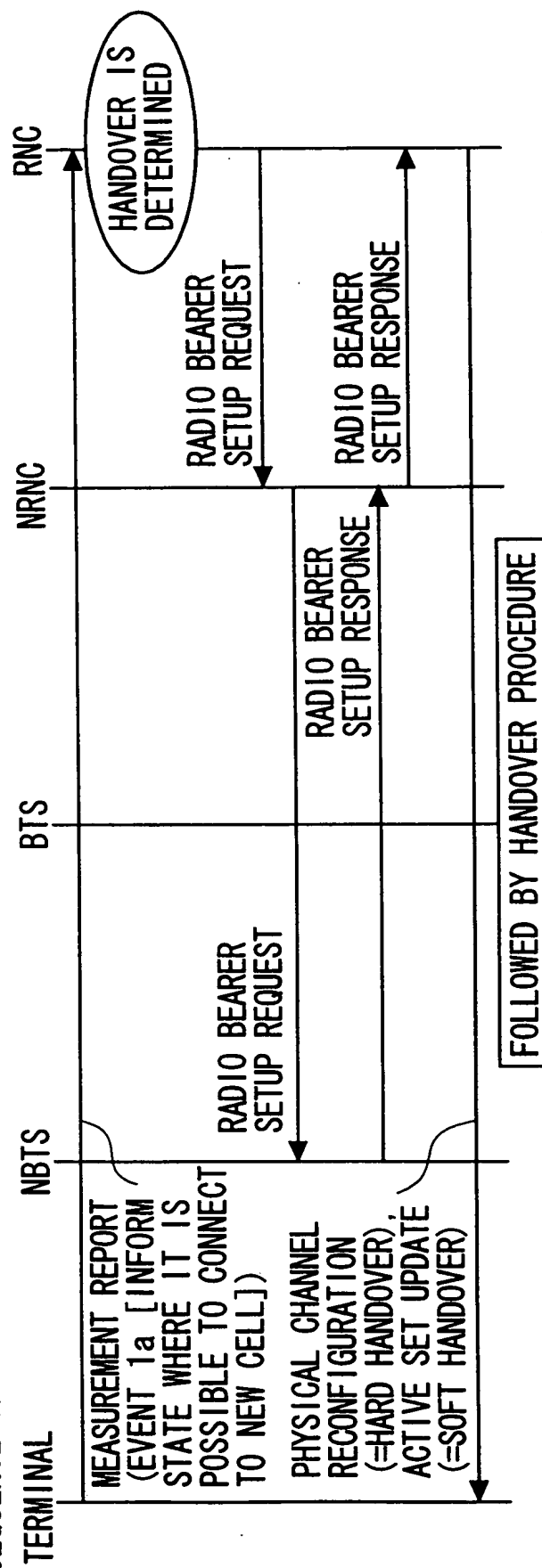


FIG. 55B

SEQUENCE IN THE CASE WHERE HANDOVER TO PERSONAL-USE BASE TRANSMISSION STATION CELL IS NOT CARRIED OUT

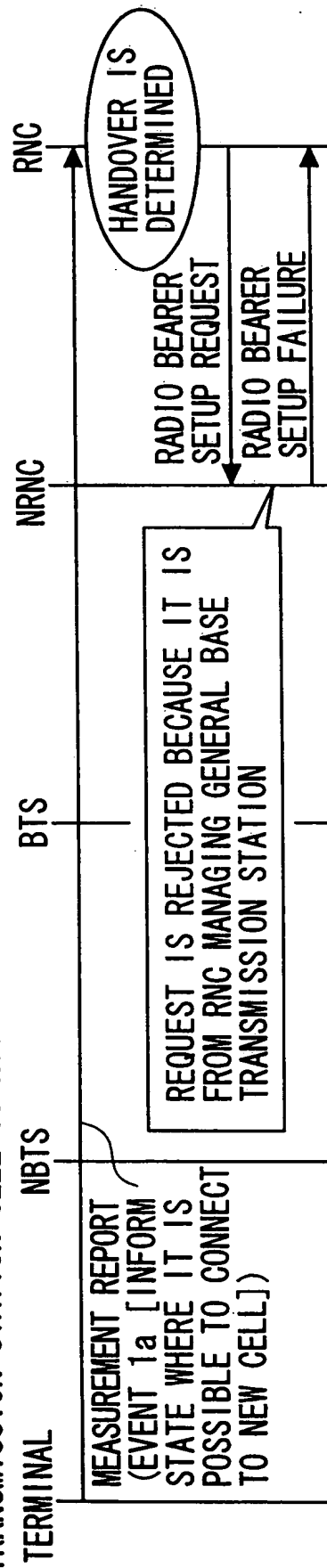


FIG. 56A

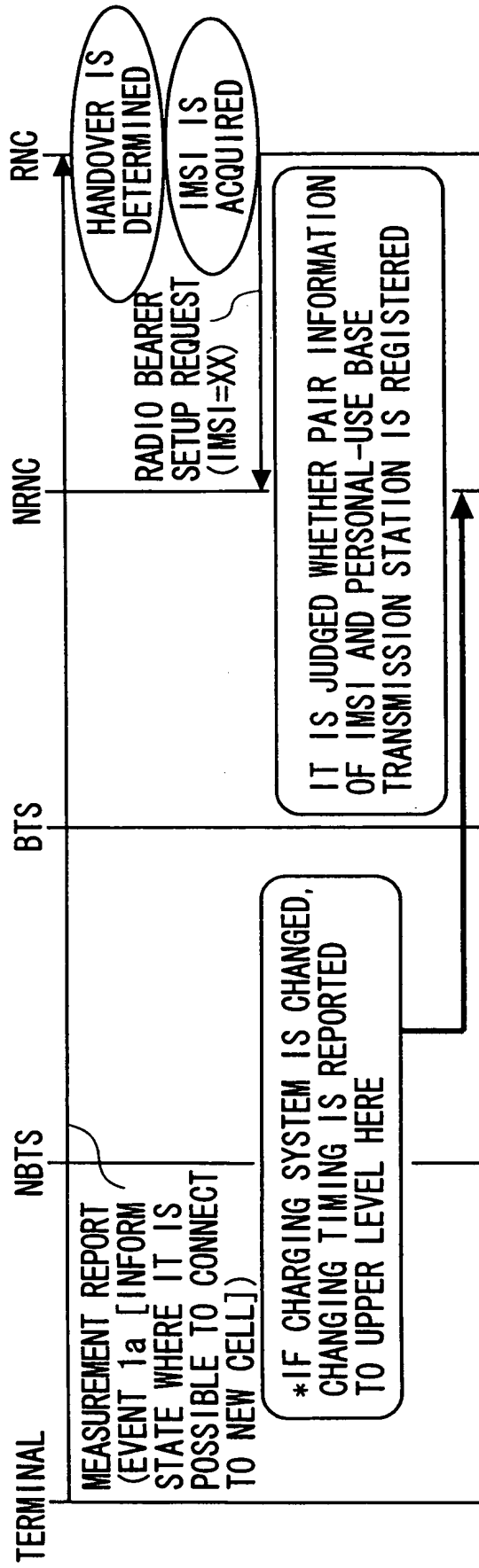


FIG. 56B

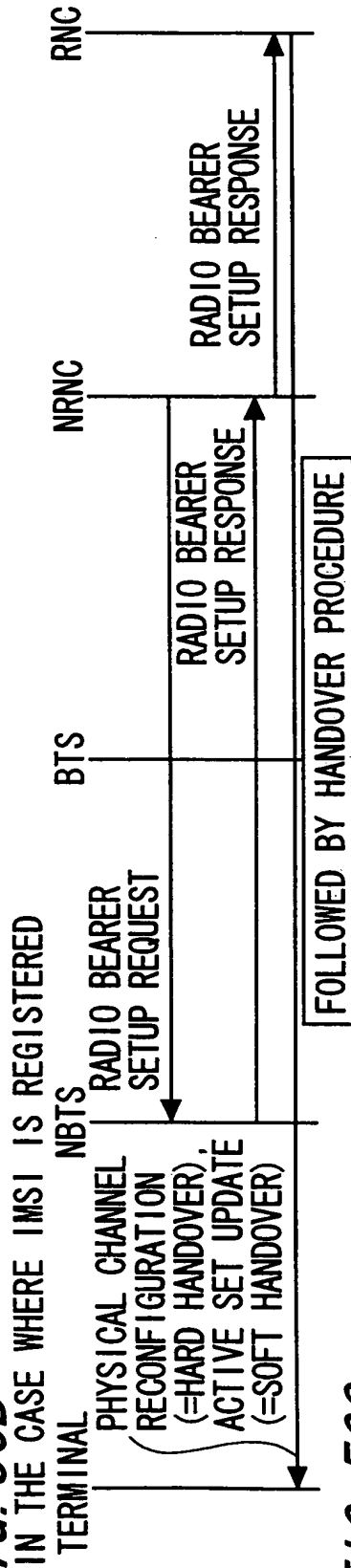


FIG. 56C

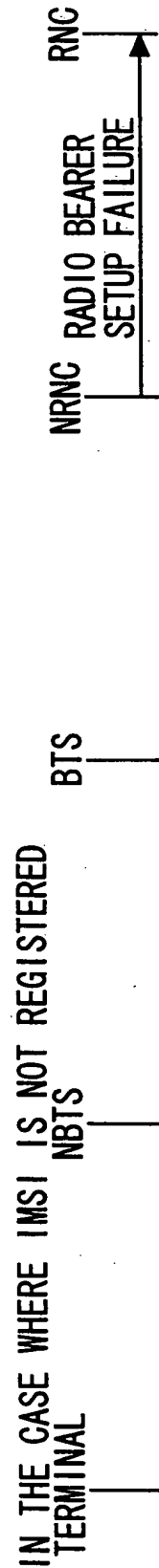
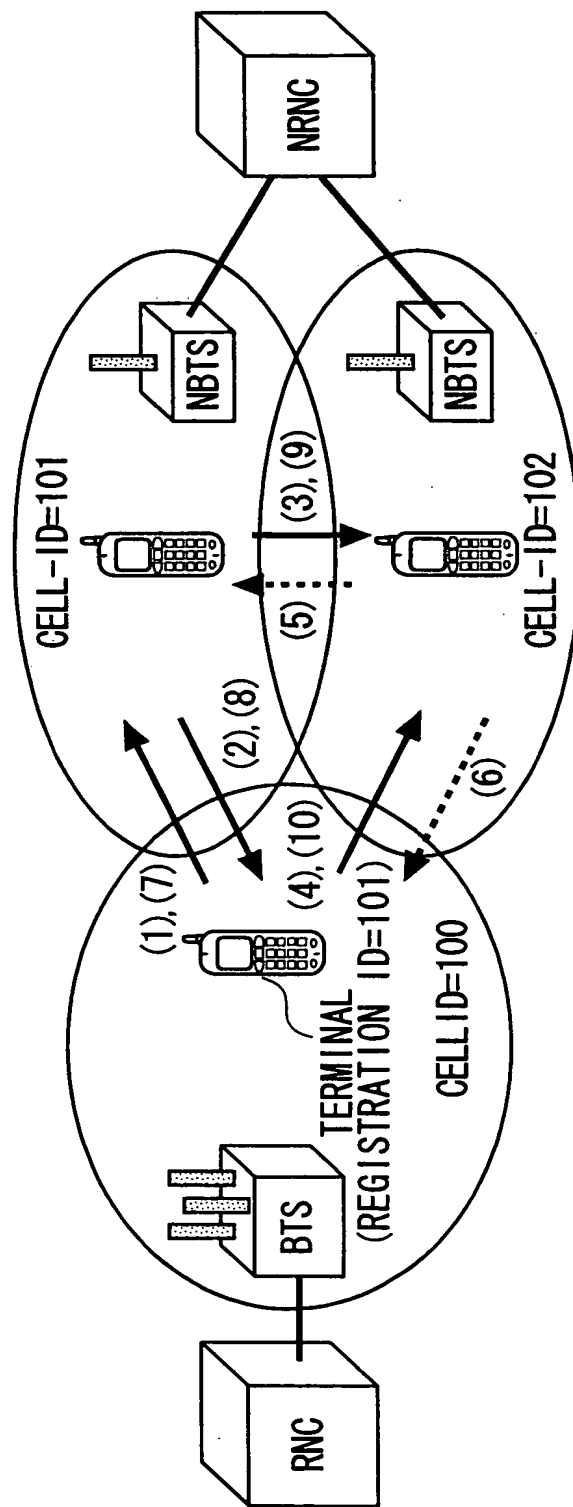


FIG. 57



• OPERATION AT THE TIME OF MOVEMENT BETWEEN CELLS (DURING COMMUNICATION)

- (1) FROM GENERAL CELL (GENERAL BASE TRANSMISSION STATION CELL) TO ALLOWED CELL (CELL OF PERSONAL-USE BASE TRANSMISSION STATION REGISTERED IN TERMINAL)
- (2) FROM ALLOWED CELL TO GENERAL CELL
- (3) FROM ALLOWED CELL TO PROHIBITED CELL (CELL OF PERSONAL-USE BASE TRANSMISSION STATION NOT REGISTERED IN TERMINAL)
- (4) FROM GENERAL CELL TO PROHIBITED CELL
- (5) FROM PROHIBITED CELL TO ALLOWED CELL → IMPOSSIBLE WHEN COMMUNICATION IS BEING PERFORMED
- (6) FROM PROHIBITED CELL TO GENERAL CELL → IMPOSSIBLE WHEN COMMUNICATION IS BEING PERFORMED
- (7) FROM GENERAL CELL TO ALLOWED CELL, HANDOVER JUDGMENT PROCESSING IS PERFORMED
- (8) FROM ALLOWED CELL TO GENERAL CELL, HANDOVER JUDGMENT PROCESSING IS PERFORMED
- (9) FROM ALLOWED CELL TO PROHIBITED CELL, HANDOVER JUDGMENT PROCESSING IS PERFORMED
- (10) FROM GENERAL CELL TO PROHIBITED CELL, HANDOVER JUDGMENT PROCESSING IS PERFORMED

FIG. 58

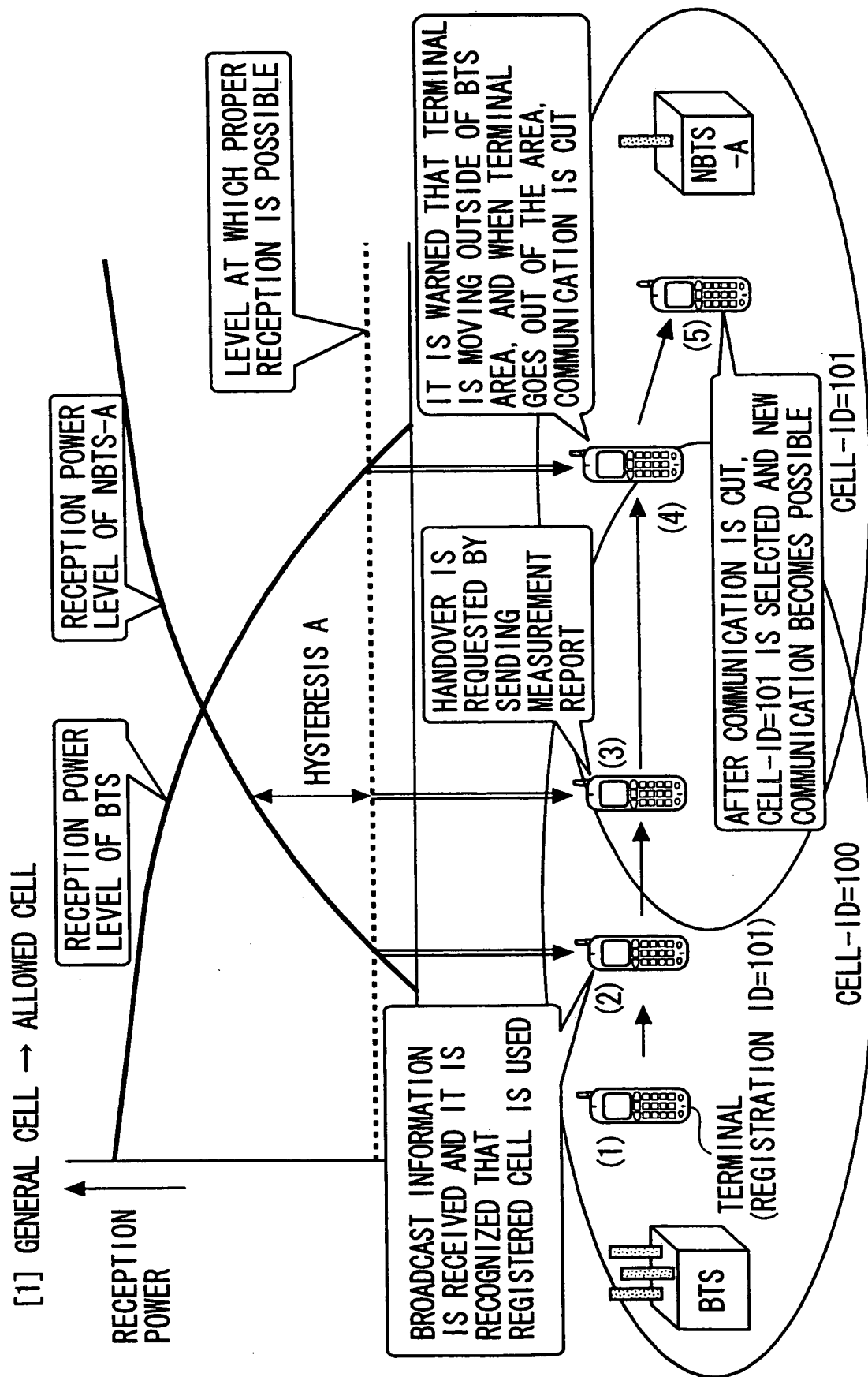
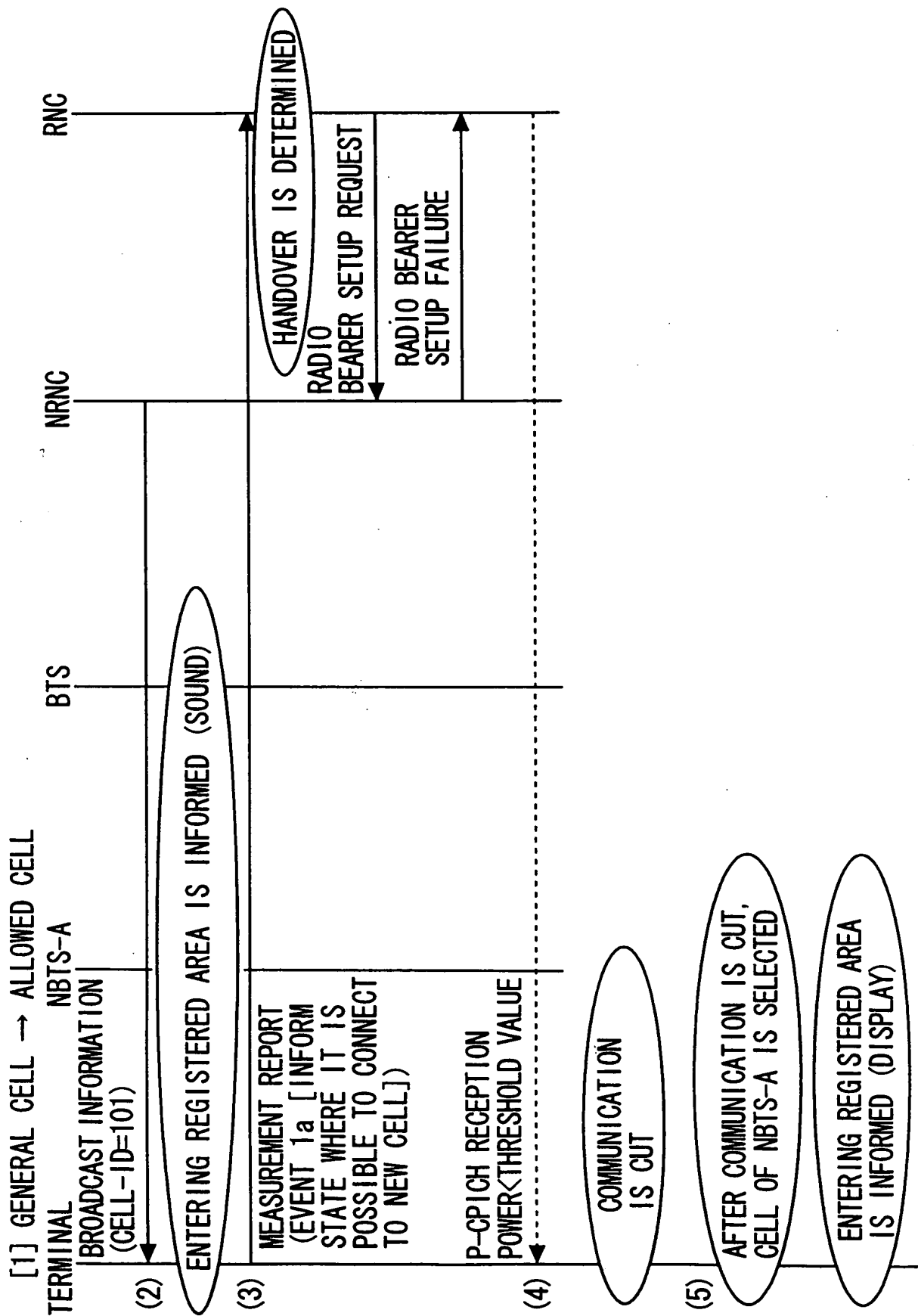


FIG. 59



[2] ALLOWED CELL → GENERAL CELL

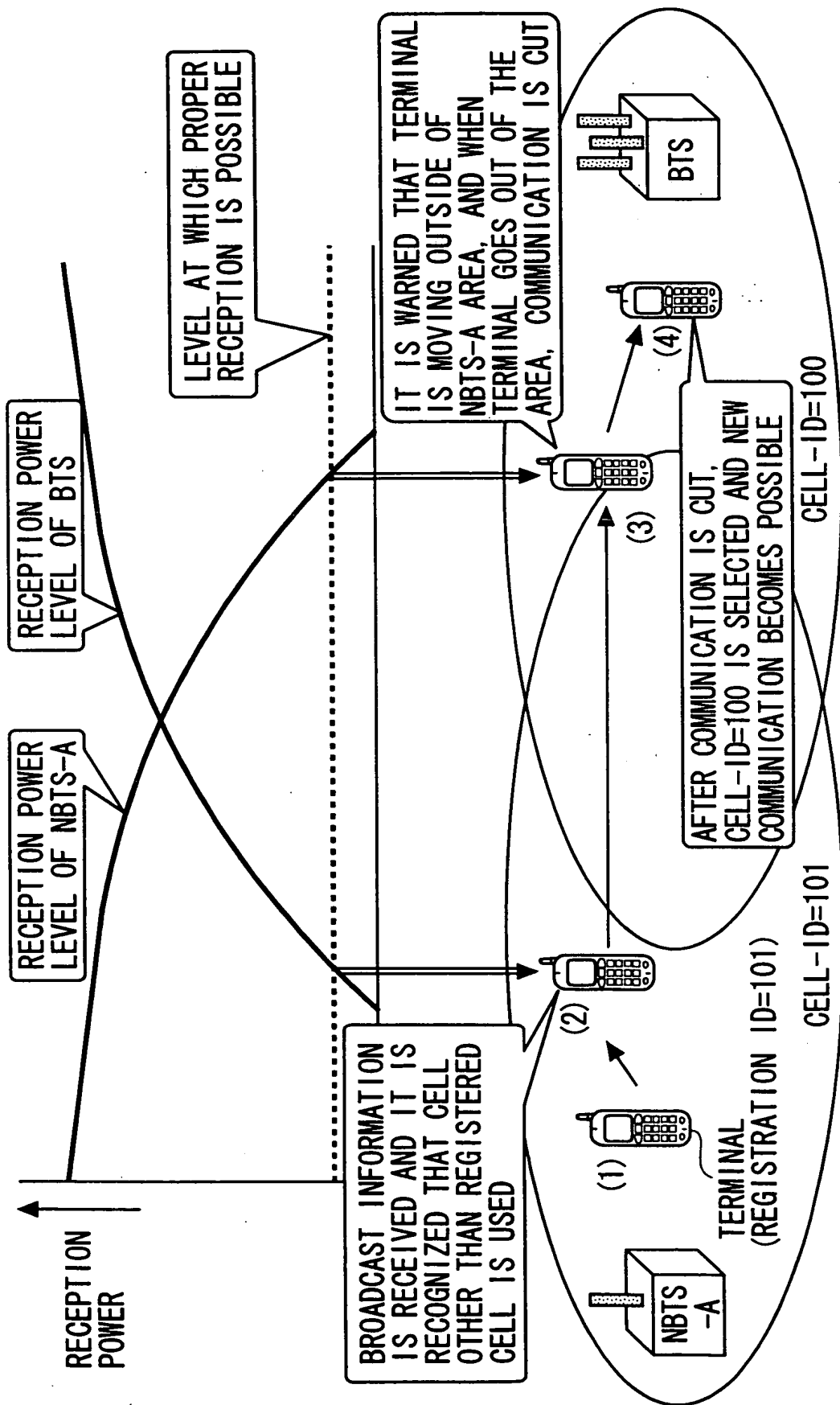


FIG. 61

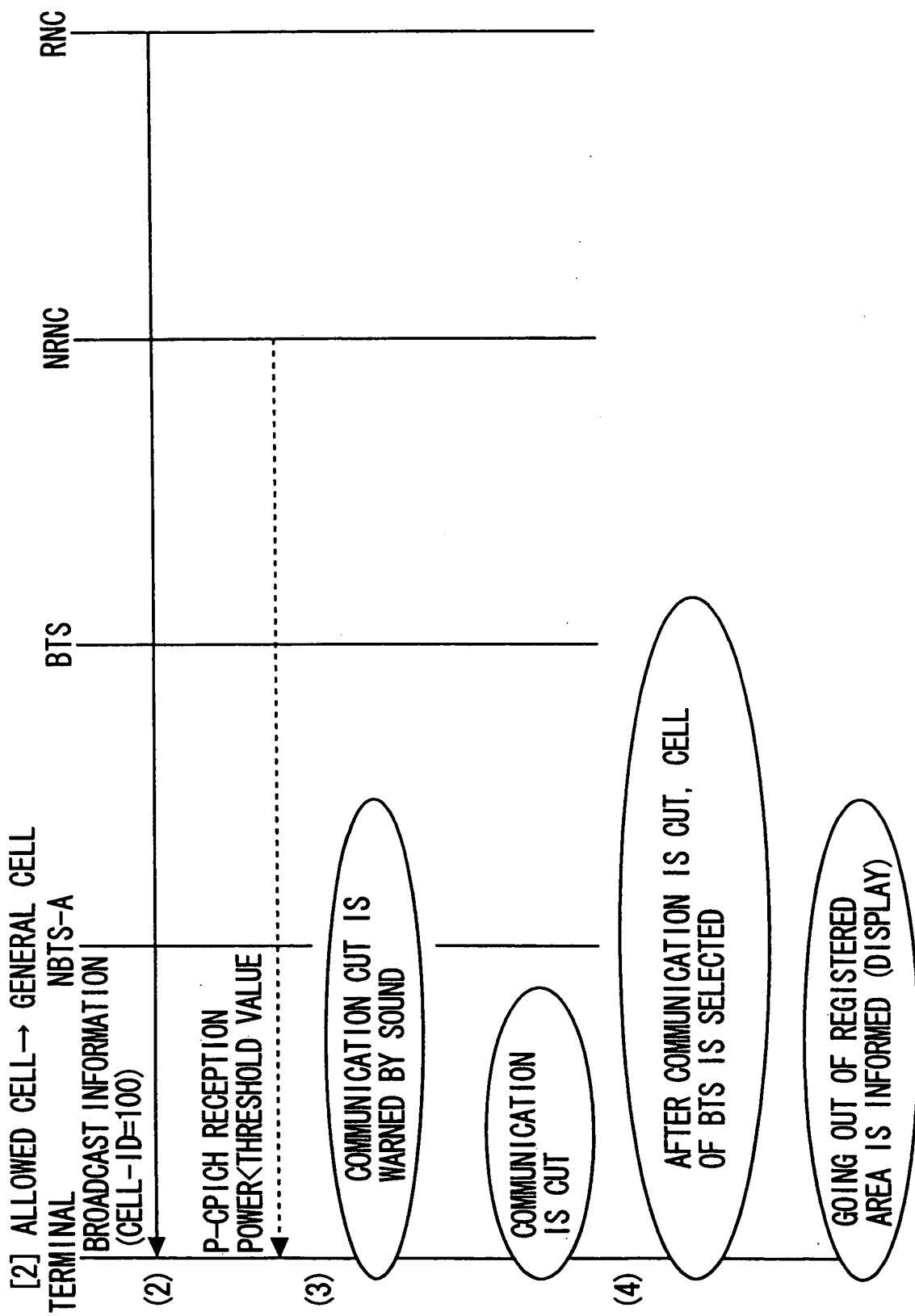


FIG. 62

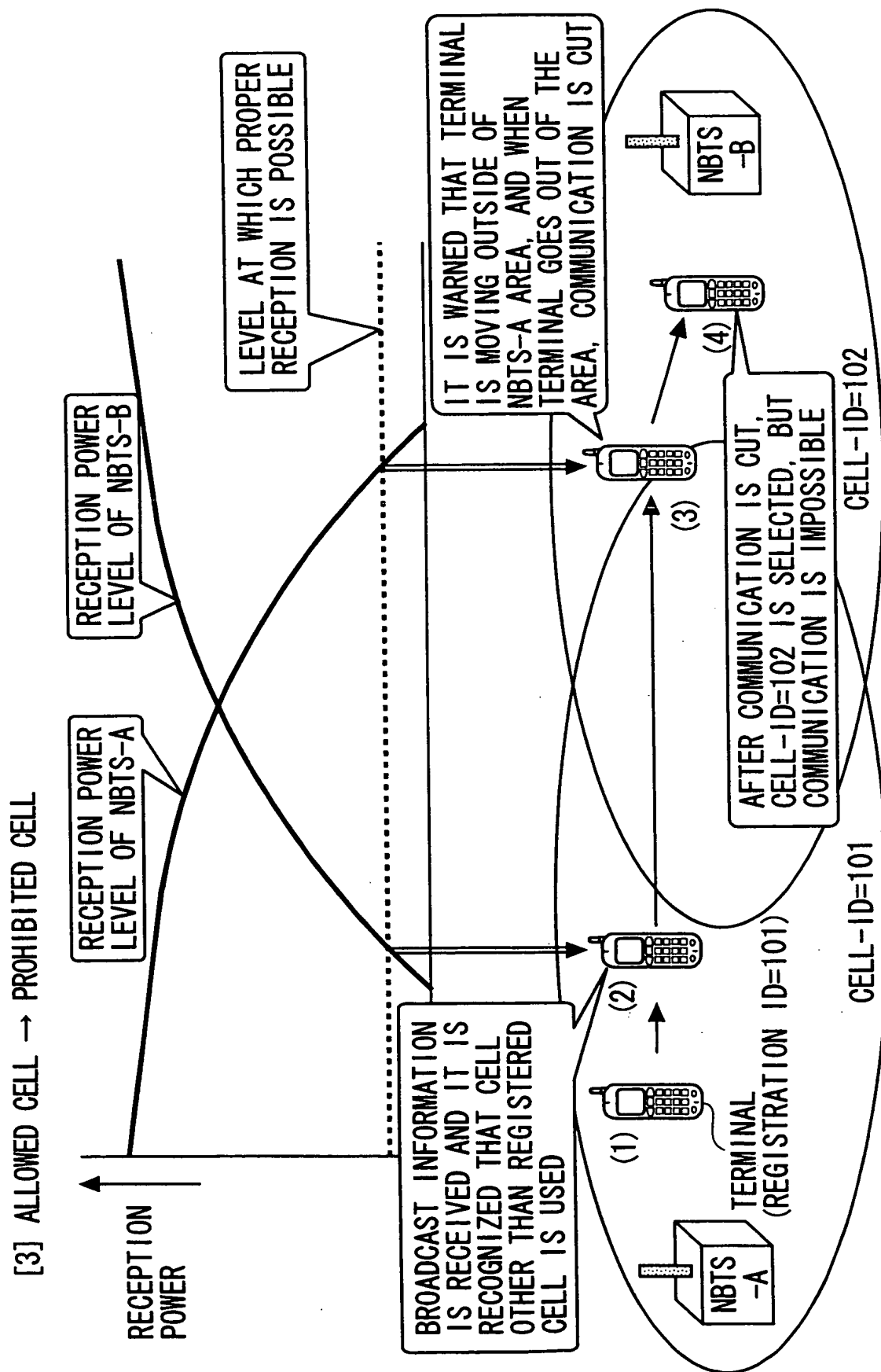


FIG. 63

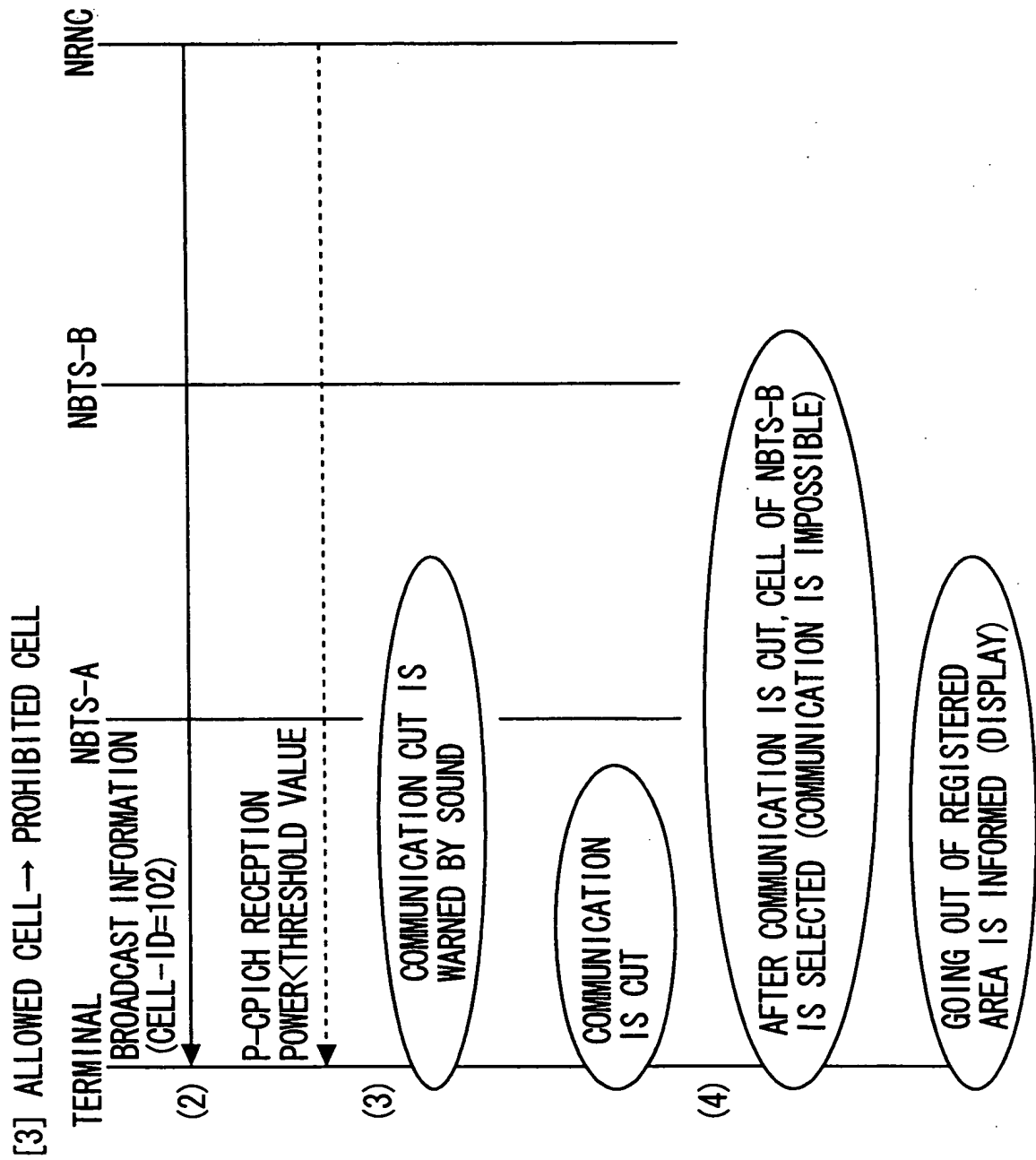


FIG. 64

[4] GENERAL CELL → PROHIBITED CELL

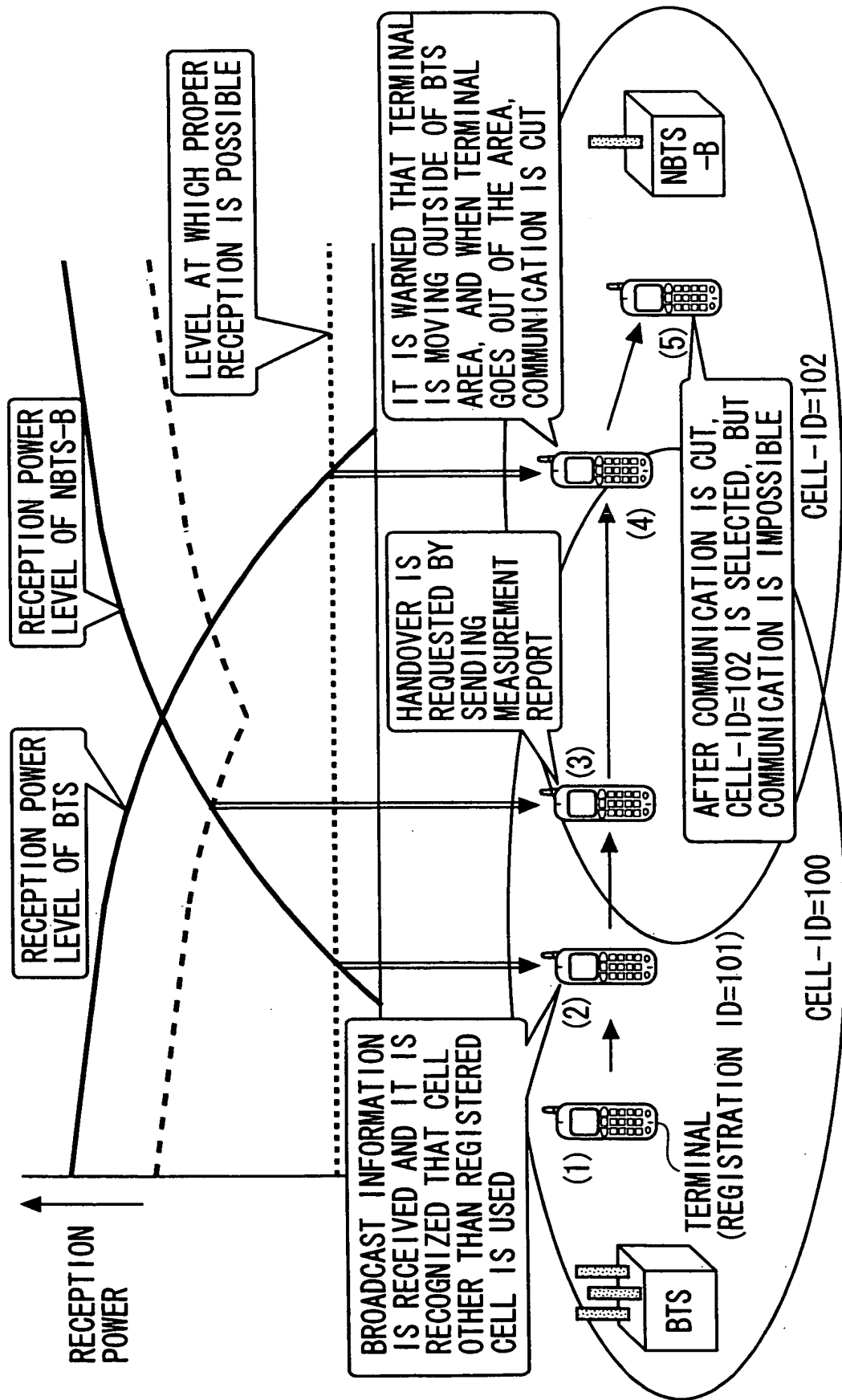


FIG. 65

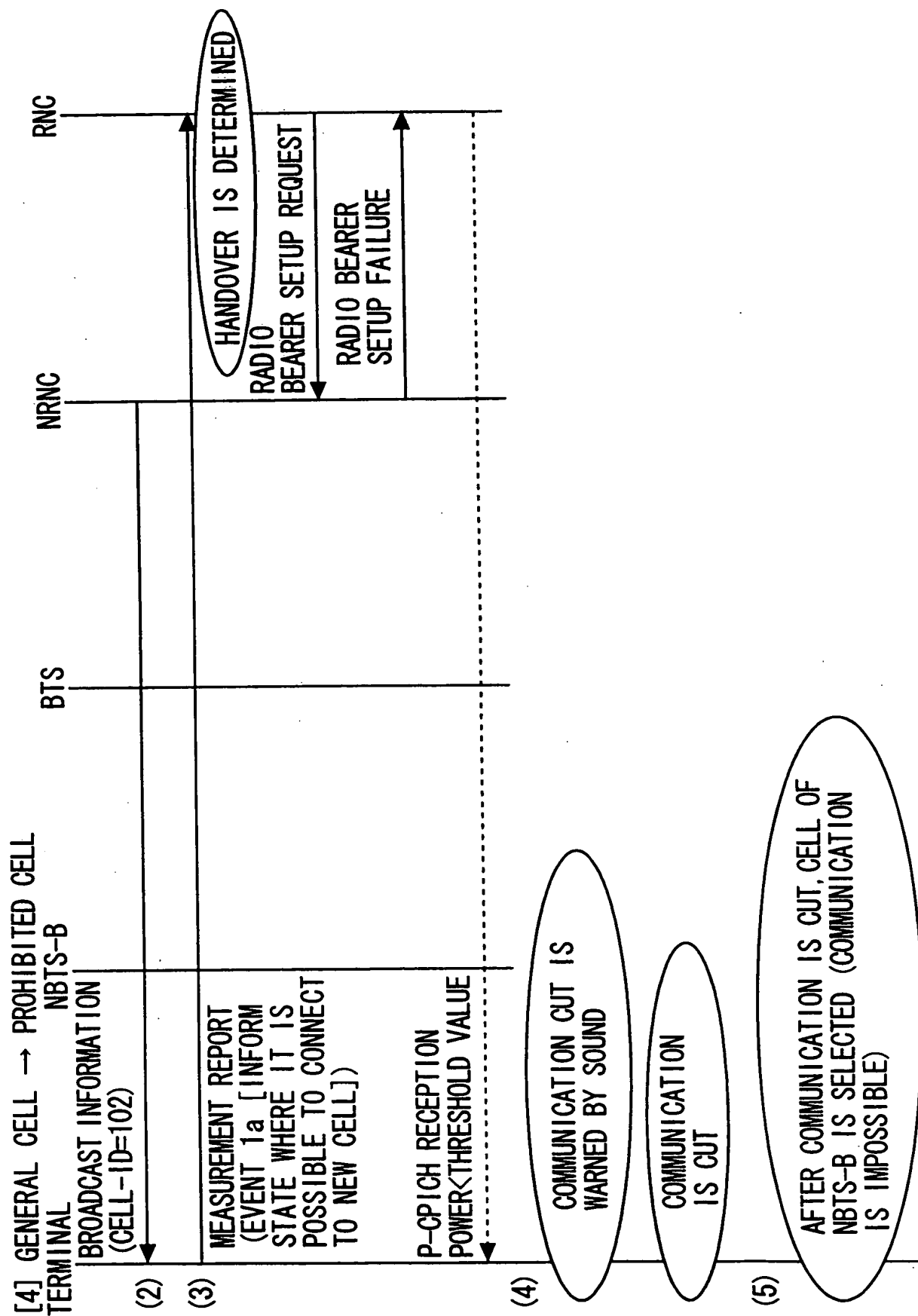


FIG. 66

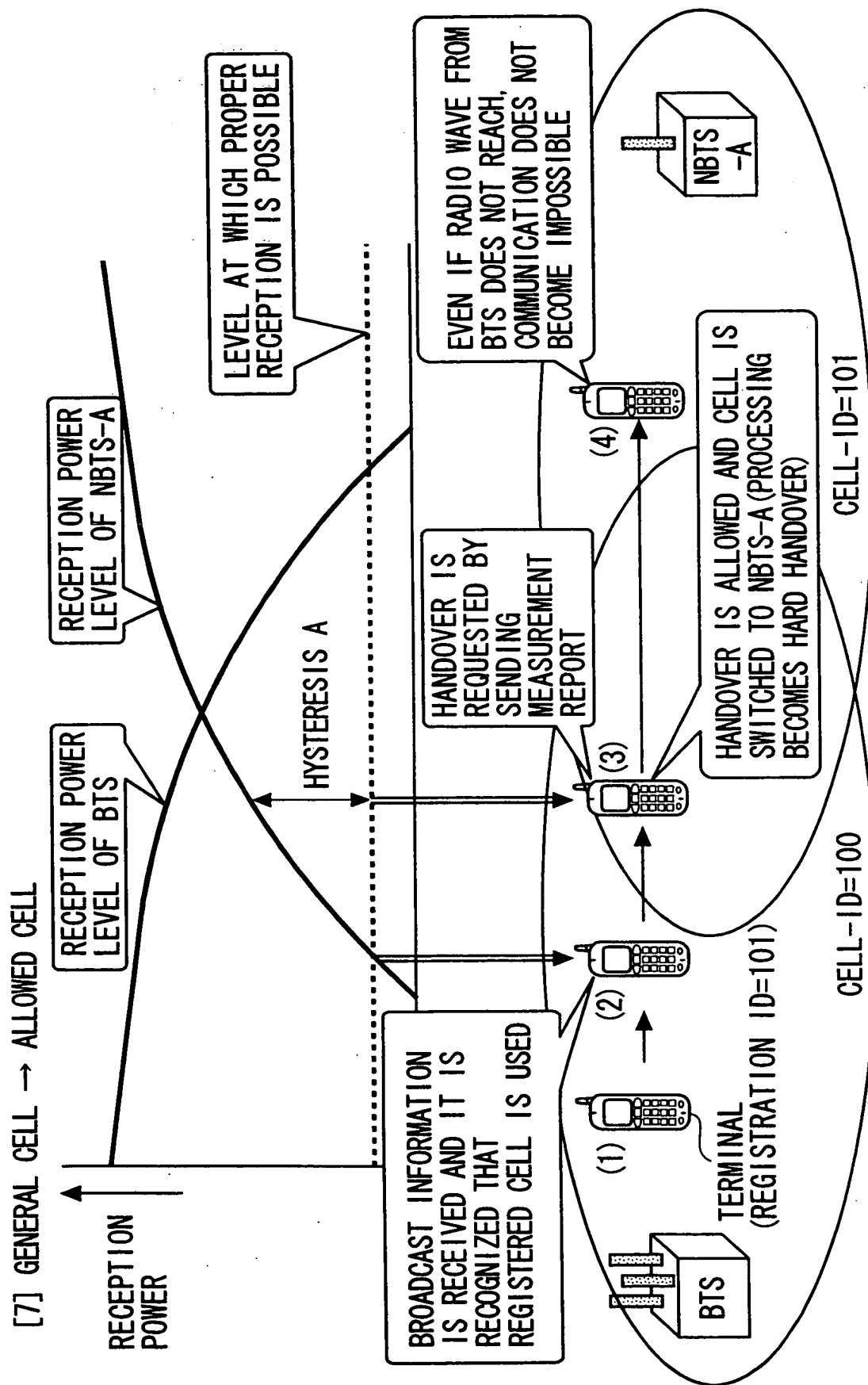


FIG. 67

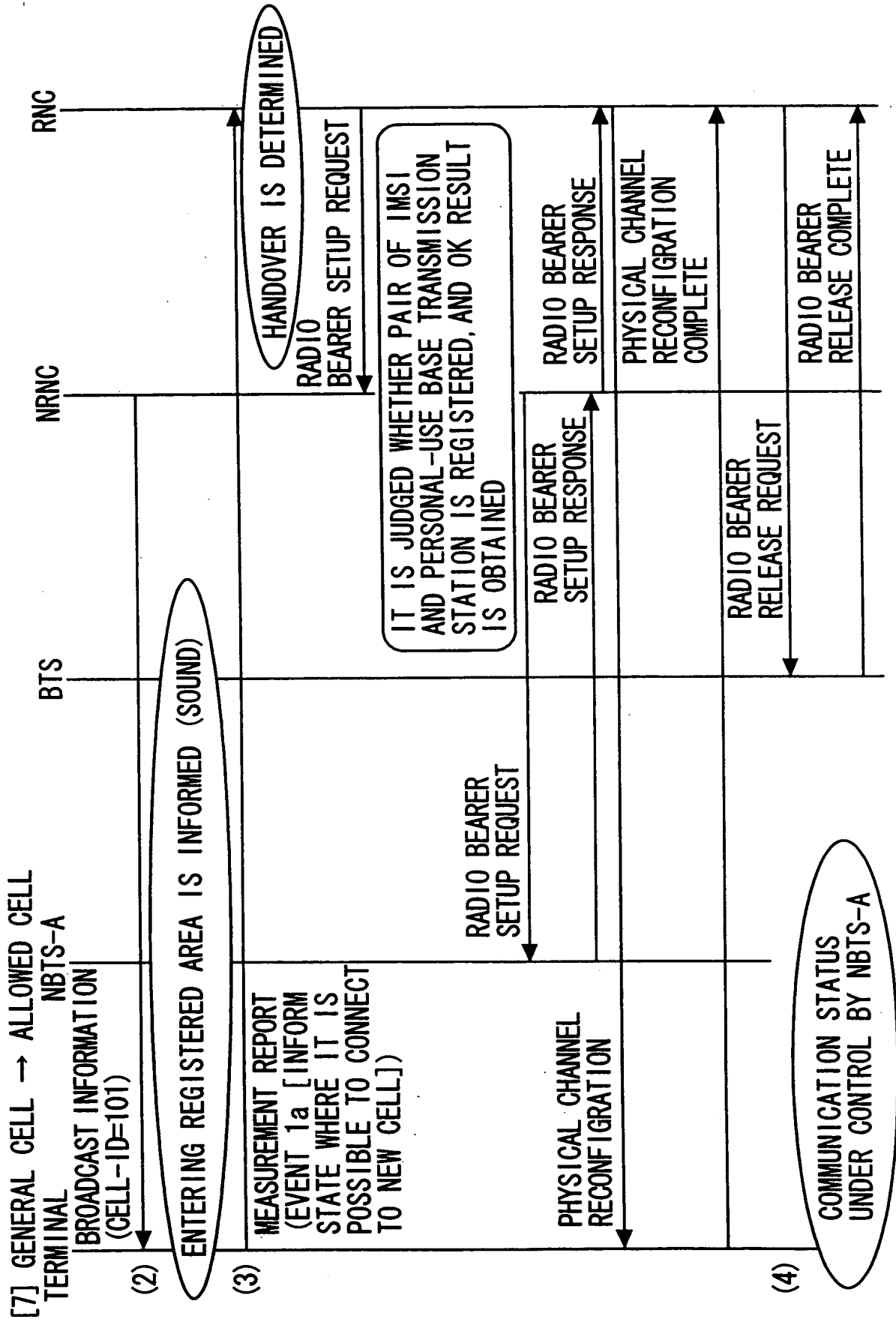


FIG. 68

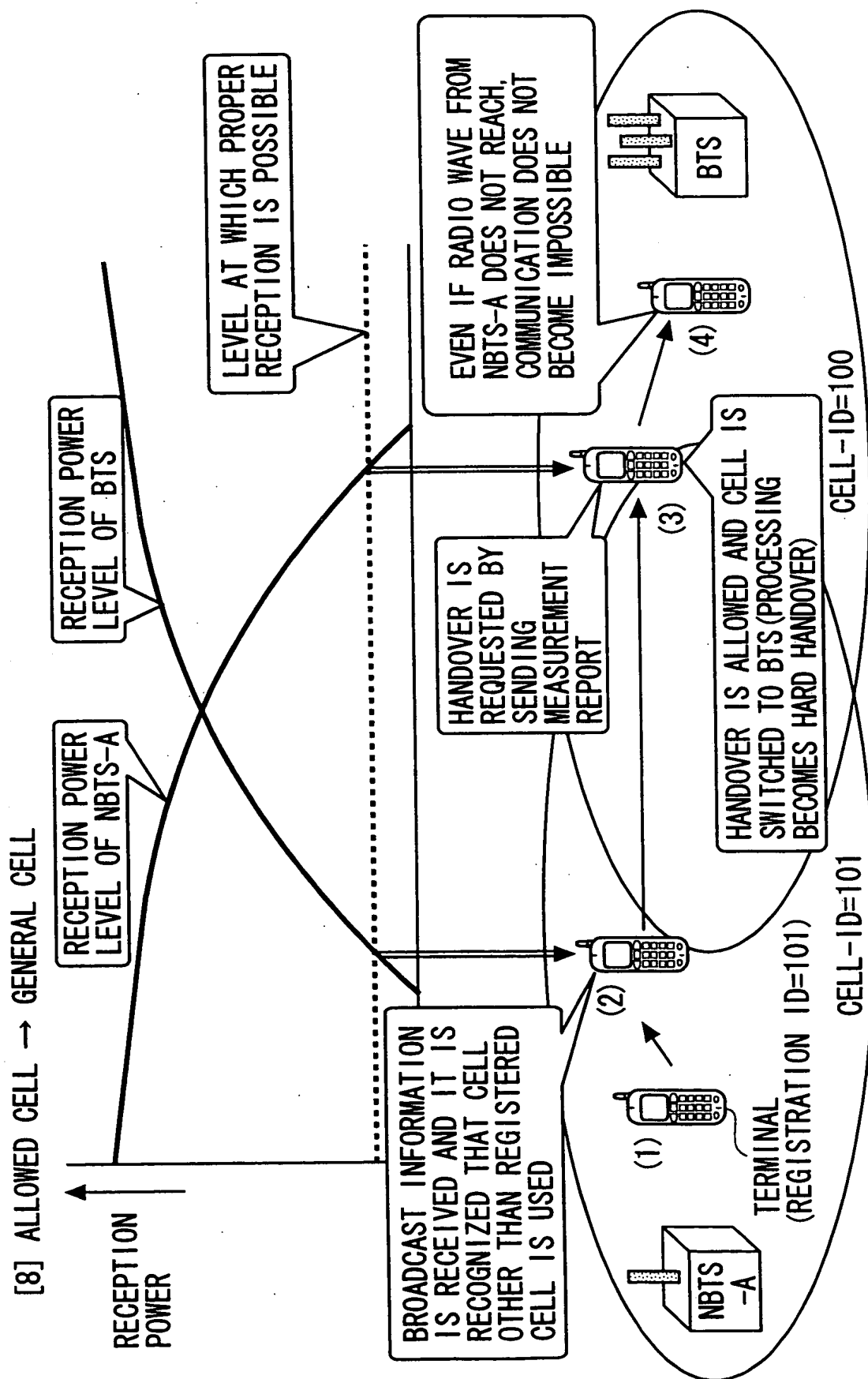


FIG. 69

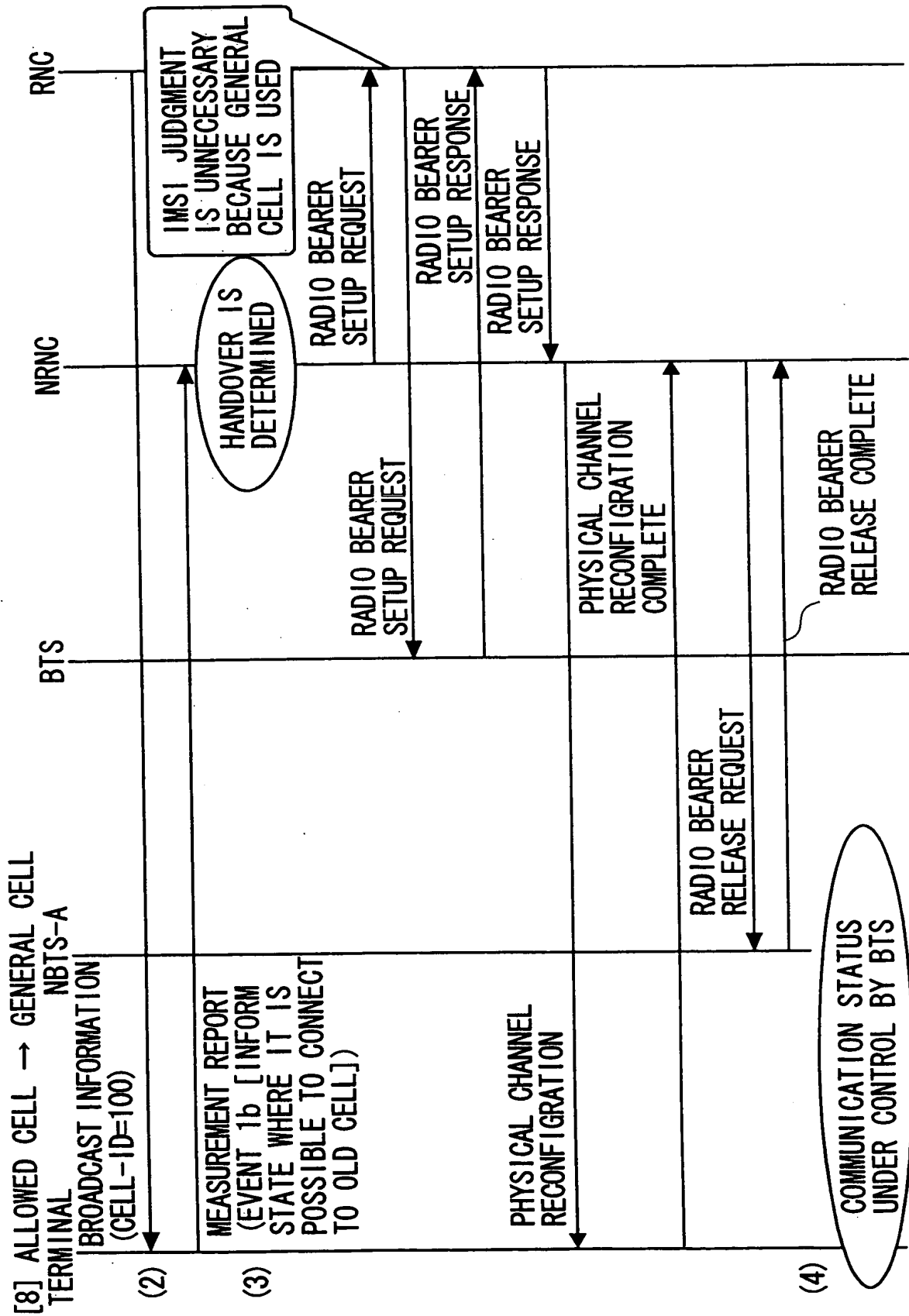


FIG. 70

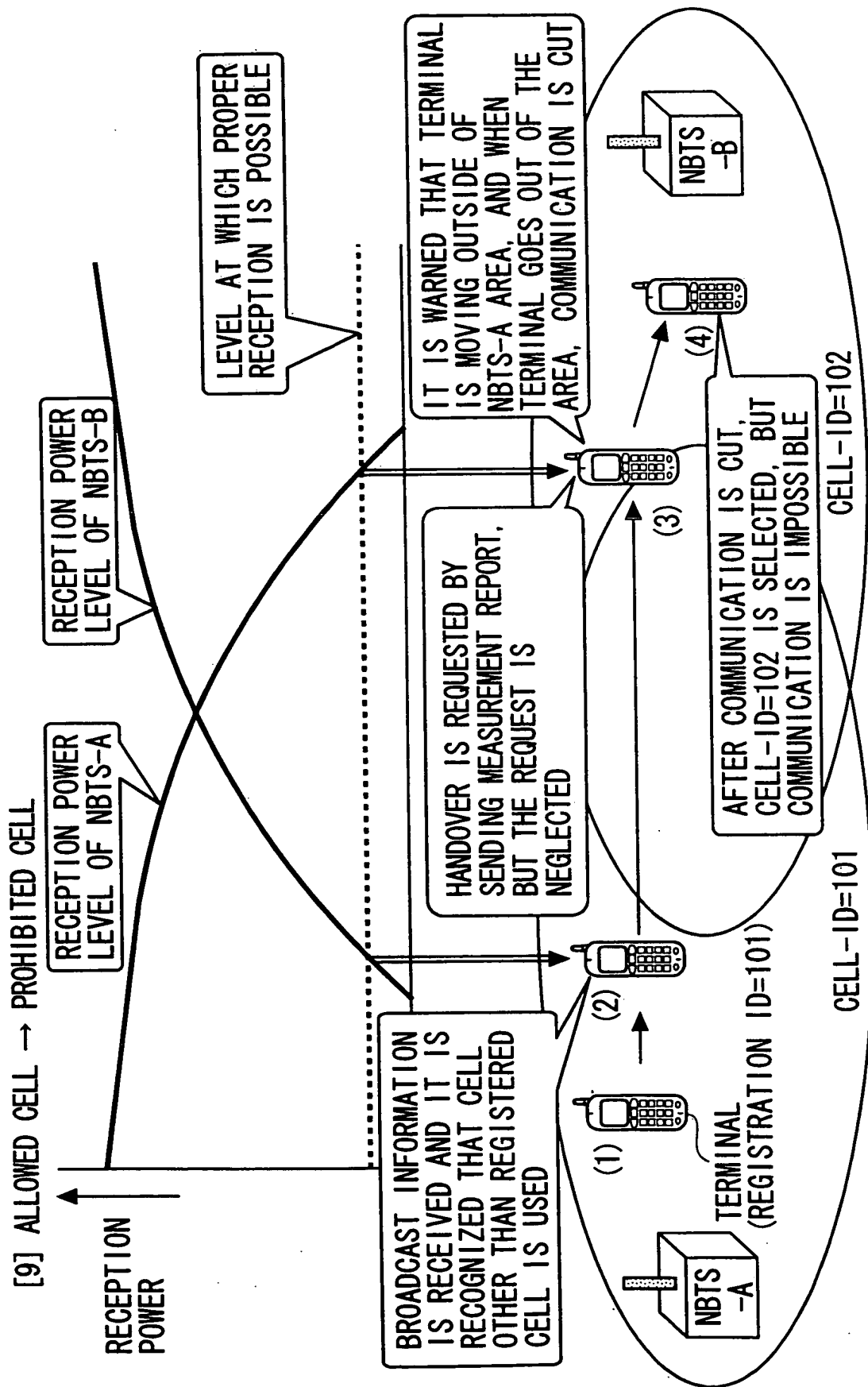


FIG. 71

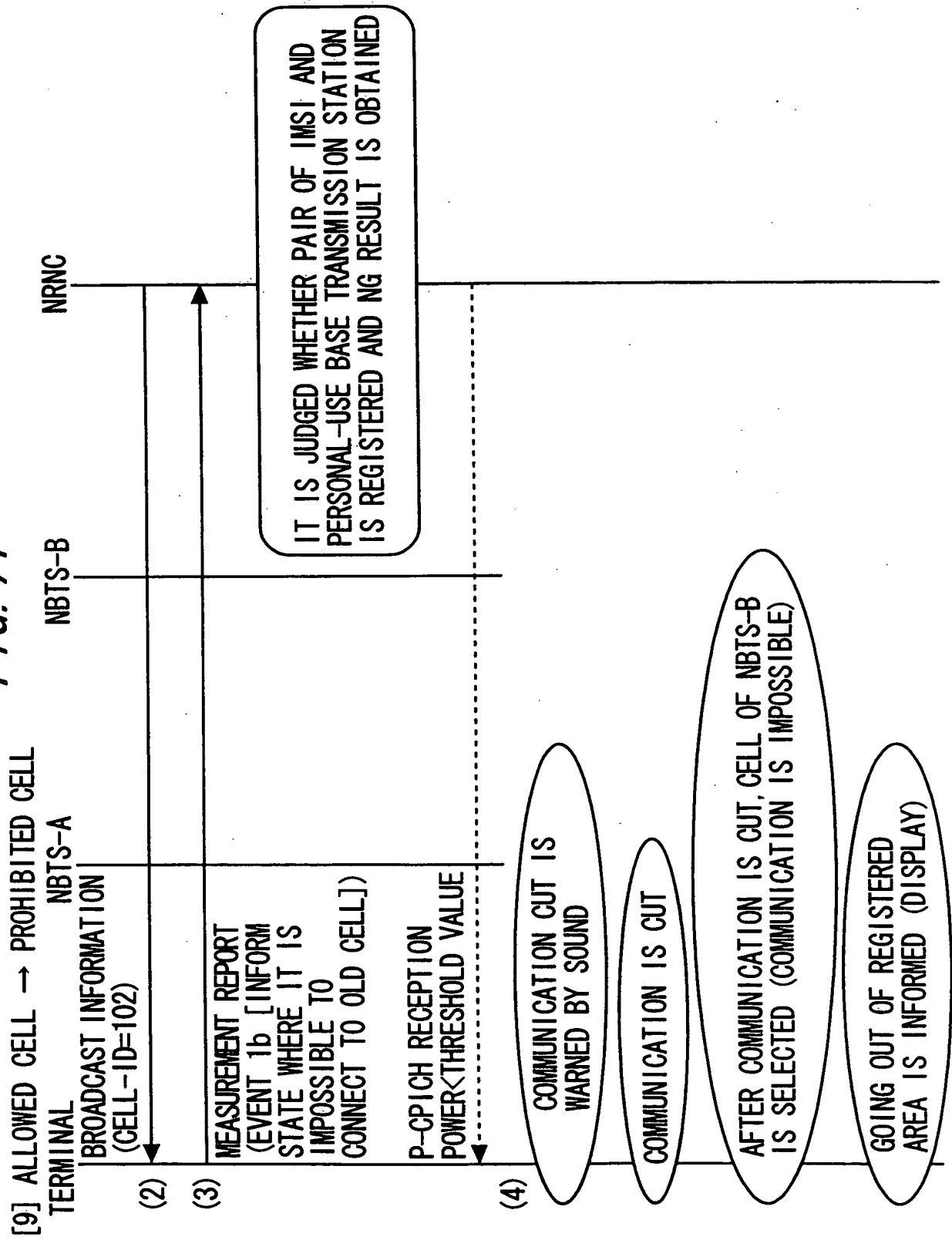


FIG. 72

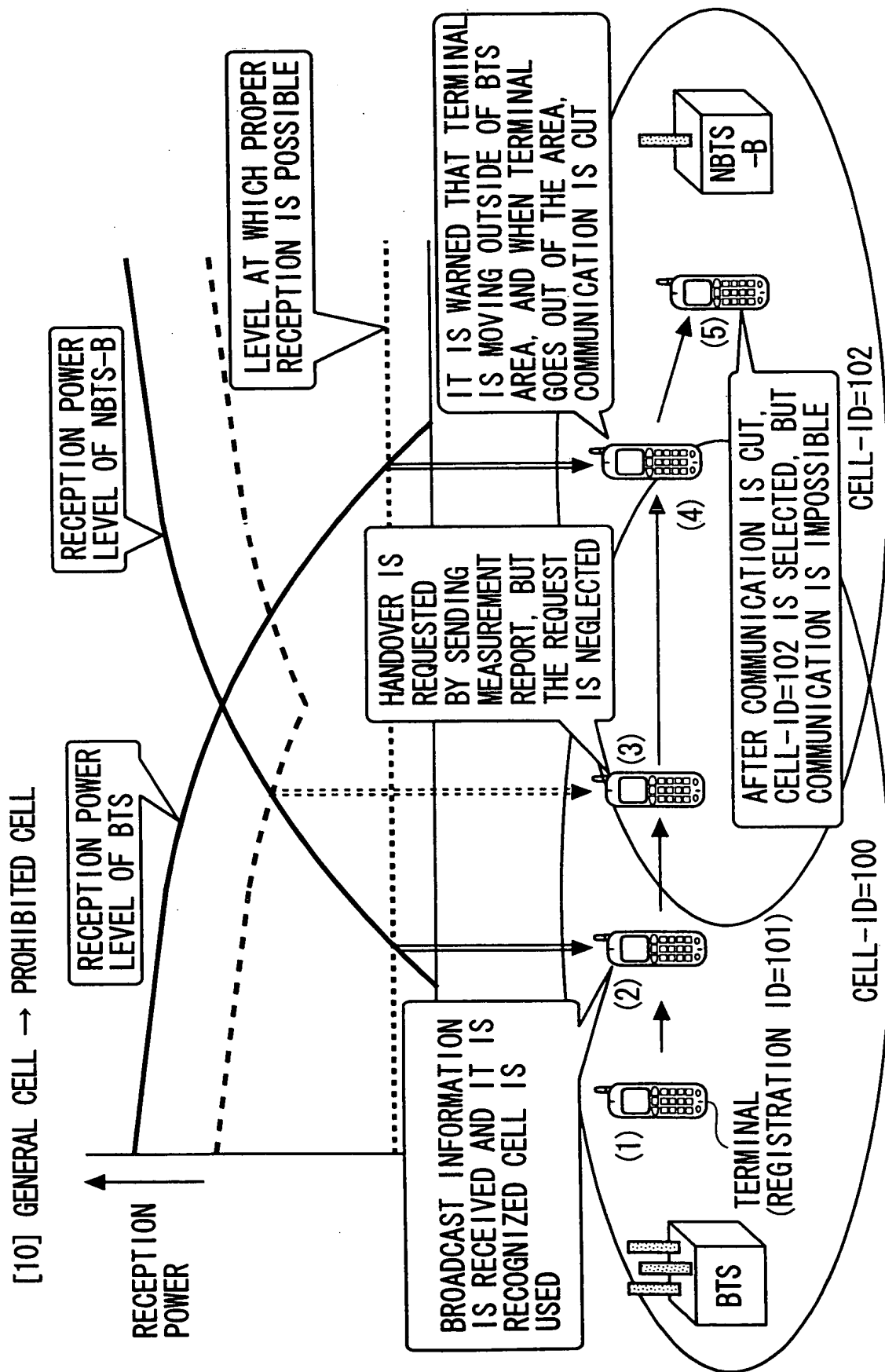


FIG. 73

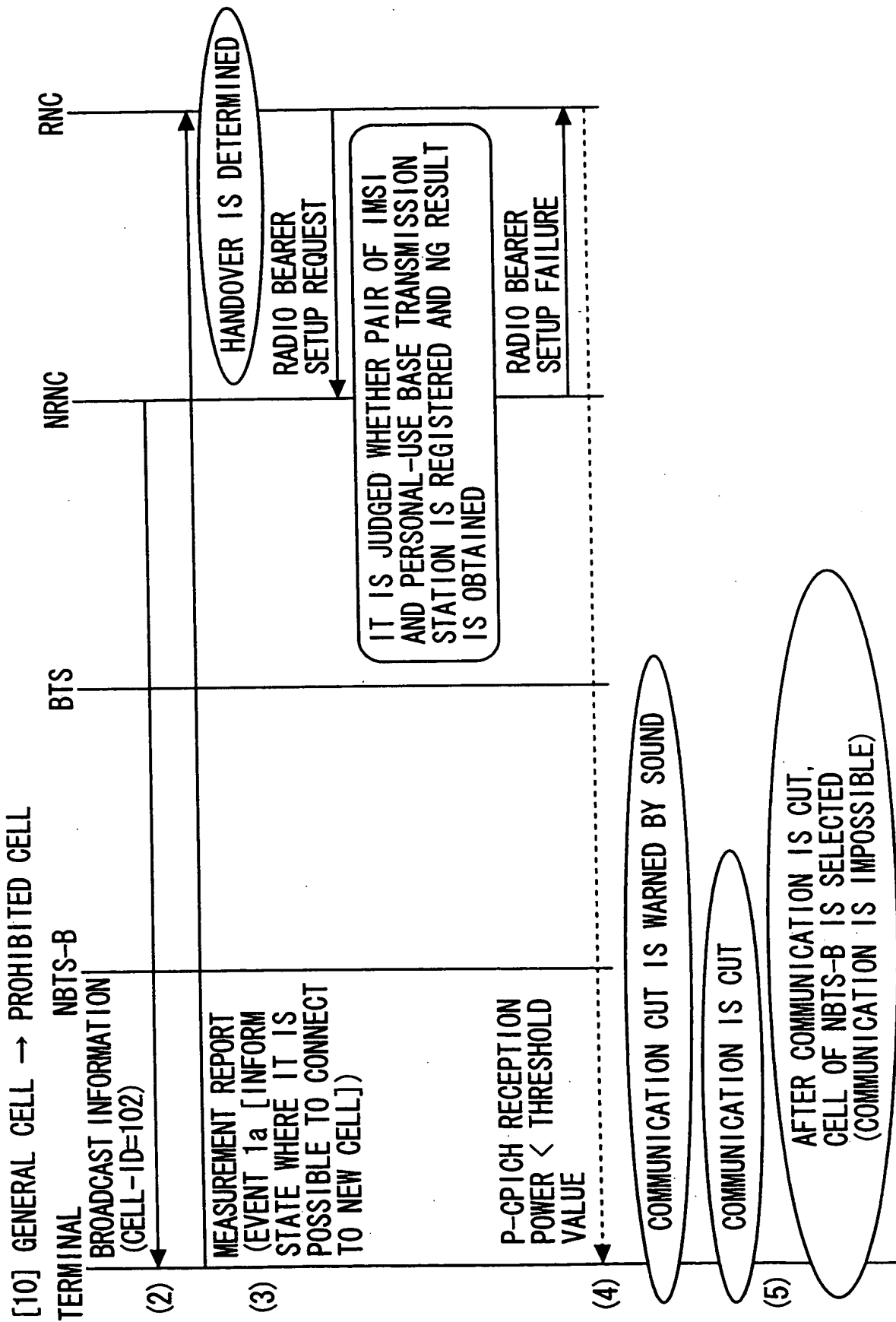


FIG. 74

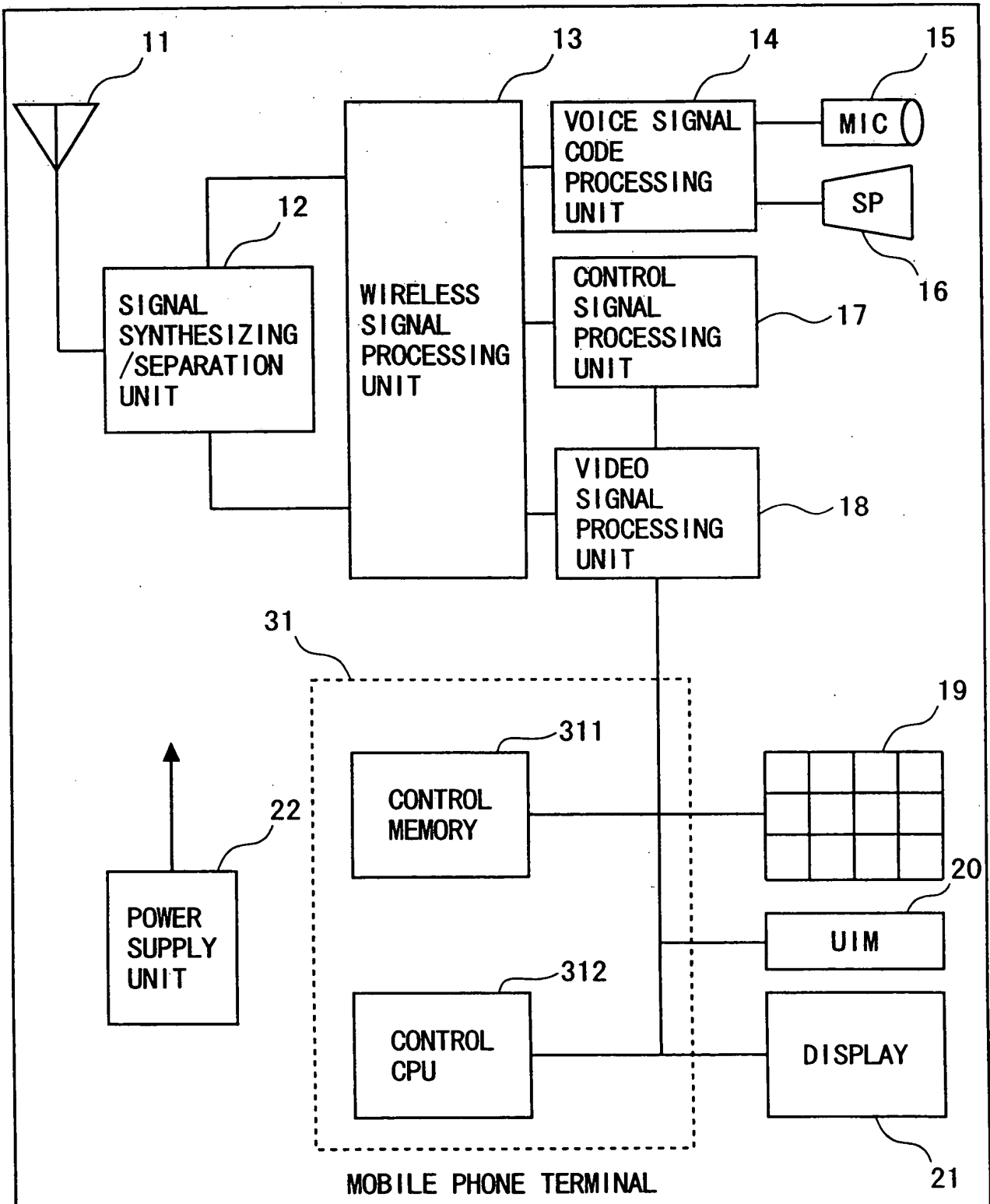


FIG. 75

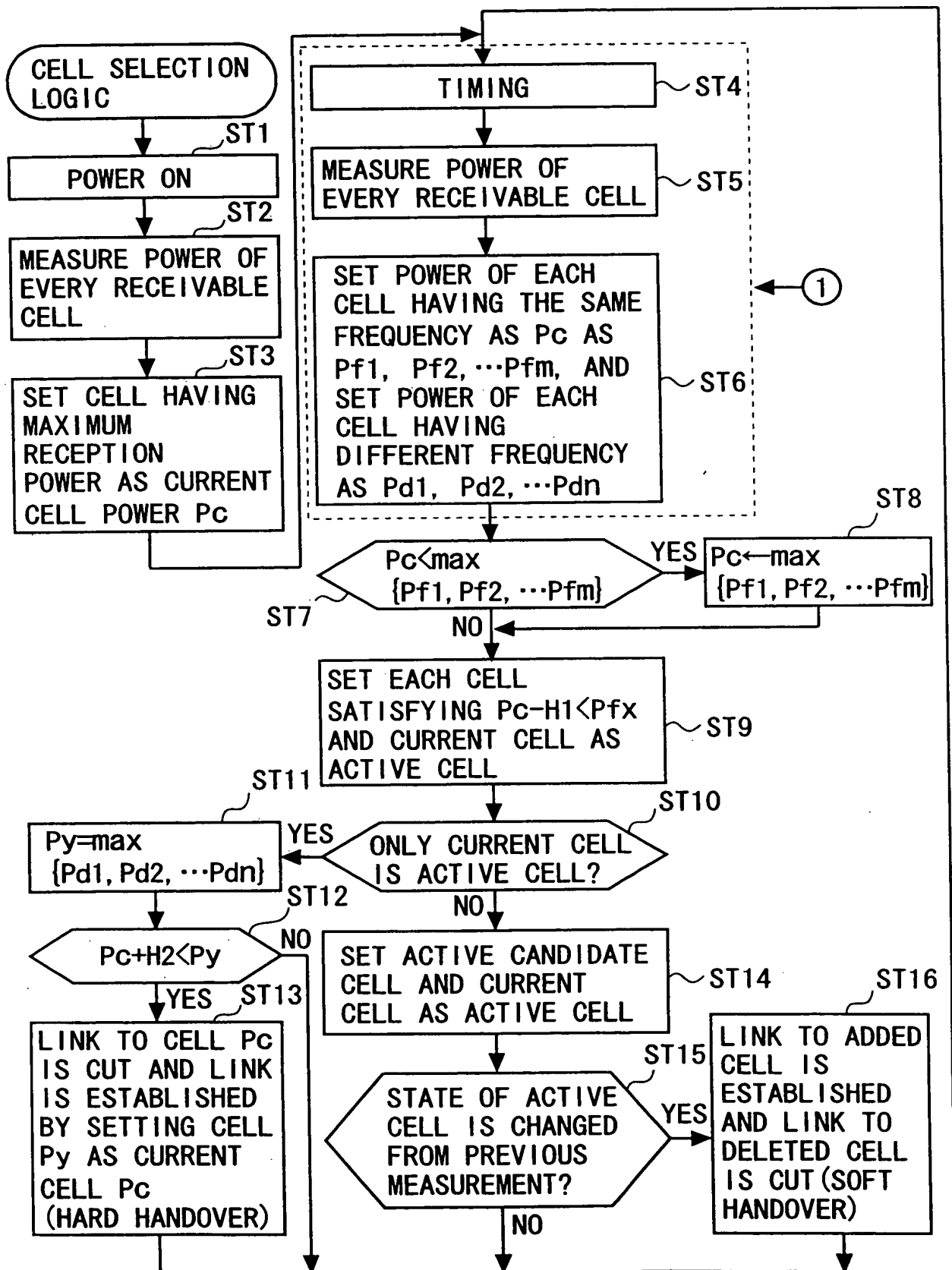


FIG. 76

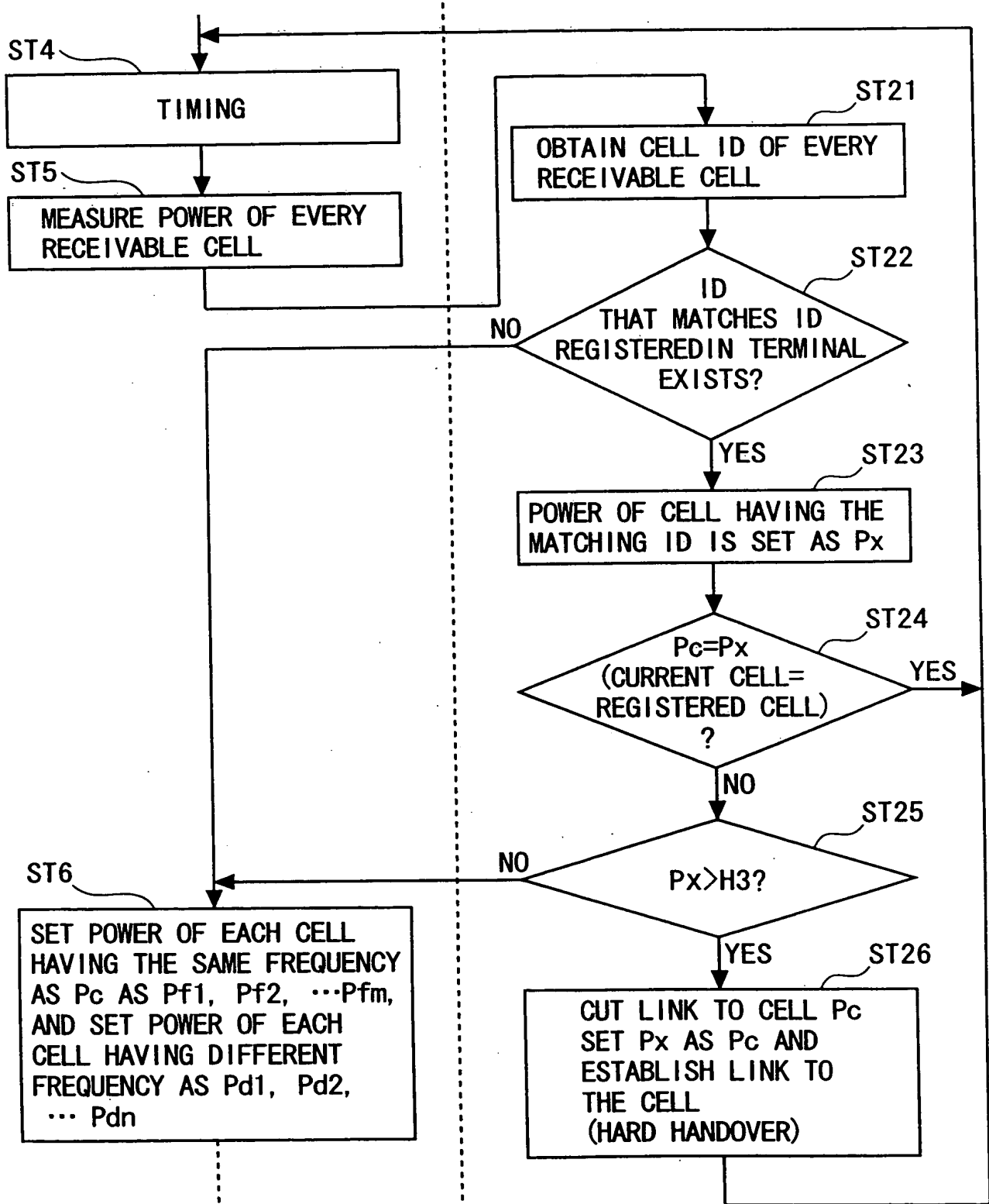


FIG. 77

